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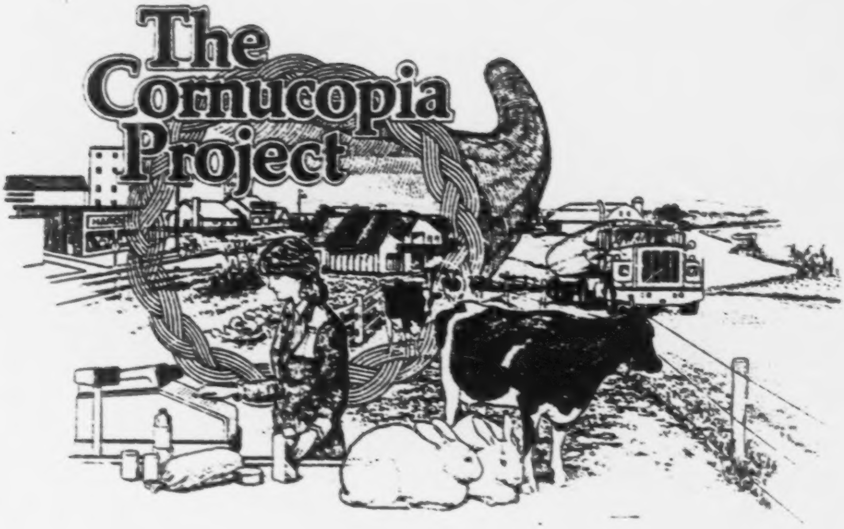
THE KANSAS FOOD SYSTEM: ANALYSIS AND ACTION TOWARD SUSTAINABILITY



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1982

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This study was funded in part by the Jessie Smith Noyes Foundation, Inc.

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PREFACE

This analysis of the Kansas food system looks at what is produced and consumed within our state and how agriculture impacts our environment and natural resources. The material present was collected with help from the Kansas State Board of Agriculture, Kansas State University, various state agencies, and with help from the staff at The Cornucopia Project of Rodale Press, the Kansas Rural Center, and the Lawrence Appropriate Technology Center.

The Kansas Food System is only the beginning of the analysis that is needed to fully evaluate our state's agriculture and food needs. It is intended to provide a larger perspective of the food system of Kansas and to plant the seeds for a healthy discussion of the future agriculture and food needs of Kansas. This study concludes with actions we can take as consumers, producers, agri-businesses, and as determiners of state government policies to create a more sustainable Kansas food system.

INTRODUCTION

Kansas is the breadbasket of the United States where extensive fields of golden grain ripen in the summer breezes. Kansas leads all states in the production of wheat which fills our nation's breadbasket and ranked first in 1980 wheat exports, sorghum silage production, and commercial grain storage capacity; second in cropland, sorghum grain production, flour milled, and dehydrated alfalfa production; fourth in cattle and calves produced and fifth in the value of farm crops (see figure A).

Although our state's agricultural productivity is impressive, our whole food system--production, consumption, and how it impacts the people and environment of Kansas--needs to be carefully analyzed to ensure a sustainable and productive Kansas food system. When the future of our food system is considered, the following discoveries should be of immediate concern:

* Between 1930 and 1980, Kansas lost 56 percent of its farms.
* Farm size increased 236 percent during this time period.
* Multi-national corporations own the two largest beef feedlots in the state and control over half of the egg production.
* The Soil Conservation Service reports that 54 percent of Kansas cropland needs additional conservation treatment.
* 6.8 million acres of Kansas cropland (14 percent of total) are losing more than 10 tons of soil per acre per year.
* Extensive areas of western Kansas have depleted over 25 percent of the Ogallala Aquifer; several areas are over 50 percent depleted.
* Commercial vegetable acreage declined 87 percent since 1930 to only 7,200 acres in 1980.
* In 1978 over 18.5 million pounds of pesticides, or 7.87 pounds per person, were used to produce Kansas' top five crops.
* Agricultural operations killed 112,000 fish (59 percent of all causes) in 1981; feedlots killed 85,000 and pesticides killed 25,000.

Figure A

Kansas Farm Facts

KANSAS' RANK IN U. S. AGRICULTURE—1980

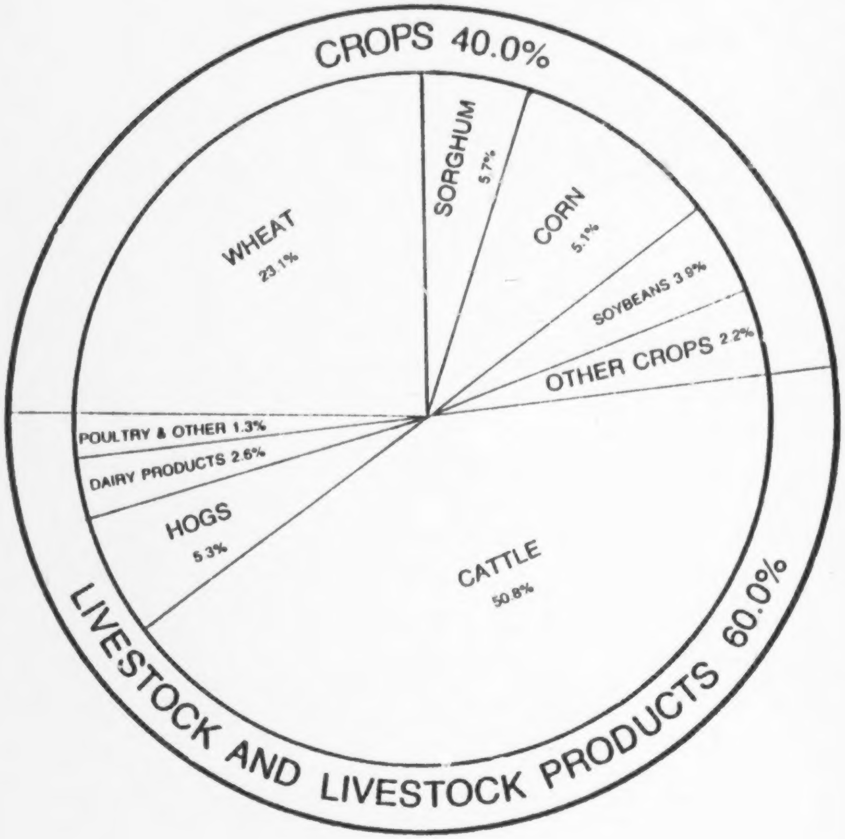
Crop or Livestock Item	Production or number	Rank	% of U.S. Produced on Kansas Farms
Wheat (all) produced	420,000,000 bu.	1	17.7
Sorghum silage produced	2,745,000 tons	1	38.6
Commercial grain storage capacity January 1, 1981	848,000,000 bu.	1	11.8
Sorghum grain produced	156,520,000 bu.	2	26.6
Flour milled	32,785,000 cwt.	2	11.6
Motor trucks on farms	157,500 number	2	5.2
Cropland [1]	30,019,593 acres	2	6.5
Grain drills on farms	67,200 number	2	6.5
Dehydrated alfalfa processed	146,800 tons	2	—
Combines on farms	40,200 number	3	7.6
Land in farms	48,300,000 acres	3	4.6
Lespedeza seed produced	650,000 lbs.	3	12.1
All cattle and calves produced	2,776,030,000 lbs.	4	6.9
Cattle and calves on grain feed January 1, 1981	1,100,000 head	4	9.9
All cattle and calves on farms January 1, 1981	6,450,000 head	4	5.6
Red-meat production by commercial slaughter plants	2,251,699,000 lbs.	4	5.8
Tall fescue seed	2,550,000 lbs.	5	3.2
Exports of farm products	2,214,900,000 dollars	5	5.5
Alfalfa seed produced	6,400,000 lbs.	6	6.3
Cash receipts from farm marketing	5,941,100,000 dollars	7	4.3
Sheep and lambs on feed January 1, 1981	60,000 head	8	3.7
Hogs produced	777,883,000 lbs.	8	3.3
Corn silage produced	3,834,000 tons	8	3.5
Popcorn produced	8,990,000 lbs.	9	1.7
Alfalfa hay produced	2,850,000 tons	10	3.6
Hogs on farms December 1, 1980	1,900,000 head	10	2.9
All hay produced	4,230,000 tons	10	3.2
Wheel and crawler tractors on farms	149,300 number	10	3.5
Corn grain produced	116,560,000 bu.	11	1.8
Field forage harvesters on farms	11,400 number	11	3.4
Dry edible beans	336,000 cwt.	11	1.3
All other hay (all excluding alfalfa)	1,380,000 tons	13	2.7
Sugar beets produced	202,000 tons	13T	.9
Red clover seed produced	450,000 lbs.	14	1.8
All sheep and lambs produced	14,089,000 lbs.	16	1.9
Soybeans produced	23,925,000 bu.	17	1.3
All sheep and lambs on farms January 1, 1981	200,000 head	17	1.5
Barley produced	2,419,000 bu.	17	.7
Rye produced	210,000 bu.	19	1.3
Milk produced	1,355,000,000 lbs.	24	1.1
Farm chickens produced	6,952,000 lbs.	31	.6
Eggs produced	427,000,000 number	32	.6

---

[1] Total cropland, 1978 U. S. Census of Agriculture

Figure B

CASH RECEIPTS, 1979



Source: 64th Annual Report and Farm Facts 1980 (Topeka: Kansas State Board of Agriculture, 1980)

- * Over 36,000 acres of prime farmland are lost each year due to urban sprawl and other non-farm uses.

- * Kansas imports over $772 million of food per year or $328 per person in 1980.

Agriculture is considered the largest and most important industry in Kansas. In 1979, Kansas farmers' cash receipts totaled $5.9 billion (see figure B), of which $3.5 billion was from livestock (ranking Kansas sixth nationally) and $2.4 was from crops (ranking Kansas twelfth).[1] Kansas is a bountiful grainary, feeding grains to ourselves, to livestock, and to others across the country and around the world. However, production of crops as currently practiced in Kansas is not sustainable into the future, family farms are in decline, our state is being urbanized, and all of these are accompanied by environmental deterioration.

The negative impacts of our current agriculture practices have been accelerated by the rapid industrialization of our state's agriculture and economy since World War II. This has resulted in centralization and specialization, people moving from rural to urban areas, and self-reliance being replaced by inter-regional dependence. While these developments have been seen as desirable in the past, the negative impacts that they created indicate that Kansas has become overly dependent upon centralized production and distribution systems which in the future may not prove to be sustainable.

When Kansas was first described on maps, it was called part of the Great American Desert. Major Stephen H. Long, a U.S. Topographical Engineer, declared in 1819 that the central American plains which included most of Kansas as:

> "almost wholly unfit for cultivation, and of course uninhabitable by a people depending upon agriculture for their subsistence. Although tracts of fertile land considerable extensive are occasionally to be met with, yet the scarcity of wood and water, almost uniformily prevalent, will prove an insuperable obstacle in the way of settling the country."[2]

Other early explorers of this prairie bio-region such as Coronado, Pike, and even Lewis and Clark had similar perceptions. None of them recognized the actual potential of this area for growing grasses--both the native grasses and the ones we now cultivate. Their perceptions were limited by the dominant cultural and economic values of their time.

The Great American Desert has been transformed into an important agricultural region. But like Long and these early explorers, our perceptions of the land we now call Kansas are limited to the dominant cultural and economic values of our time and it is sometimes difficult for us to see what we are doing to our resource base and the beauty of our land, water, and environment.

The land of Kansas may be on the verge of another transformation. The pioneers who broke the prairie sod are a recent memory. The miners of soil and groundwater who followed are still with us. They are guided by our economic system and sophisticated technology. But these activities, by choice or necessity, will change. We have the potential to creatively transform Kansas into a region that has a sustainable food system: one that is productive, diverse, self-reliant, and over time could almost become indigenous--as the prairie was.

Kansas is located in the heart of the prairie bio-region and the center of the contiguous 48 states of the United States. It is an area of rolling plains with a total area of 82,262 square miles or 52,647,680 acres. The prairies and wind-blown materials (loess) endow Kansas with some of the most productive soils in the world. Farming accounts for the greatest use of land resources, 49,278,000 acres, nearly 94 percent of the state's total land area.[3] There are over 27.3 million acres of prime farmland in Kansas, 7.9 percent of the national total, excluding Alaska. Of the total land surface of Kansas, over half (51.8 percent) is prime farmland.[4] Our state has more cropland than any other state except Texas[5] and this resource can guarantee future prosperity for the state if we use and manage it wisely (see figure C).

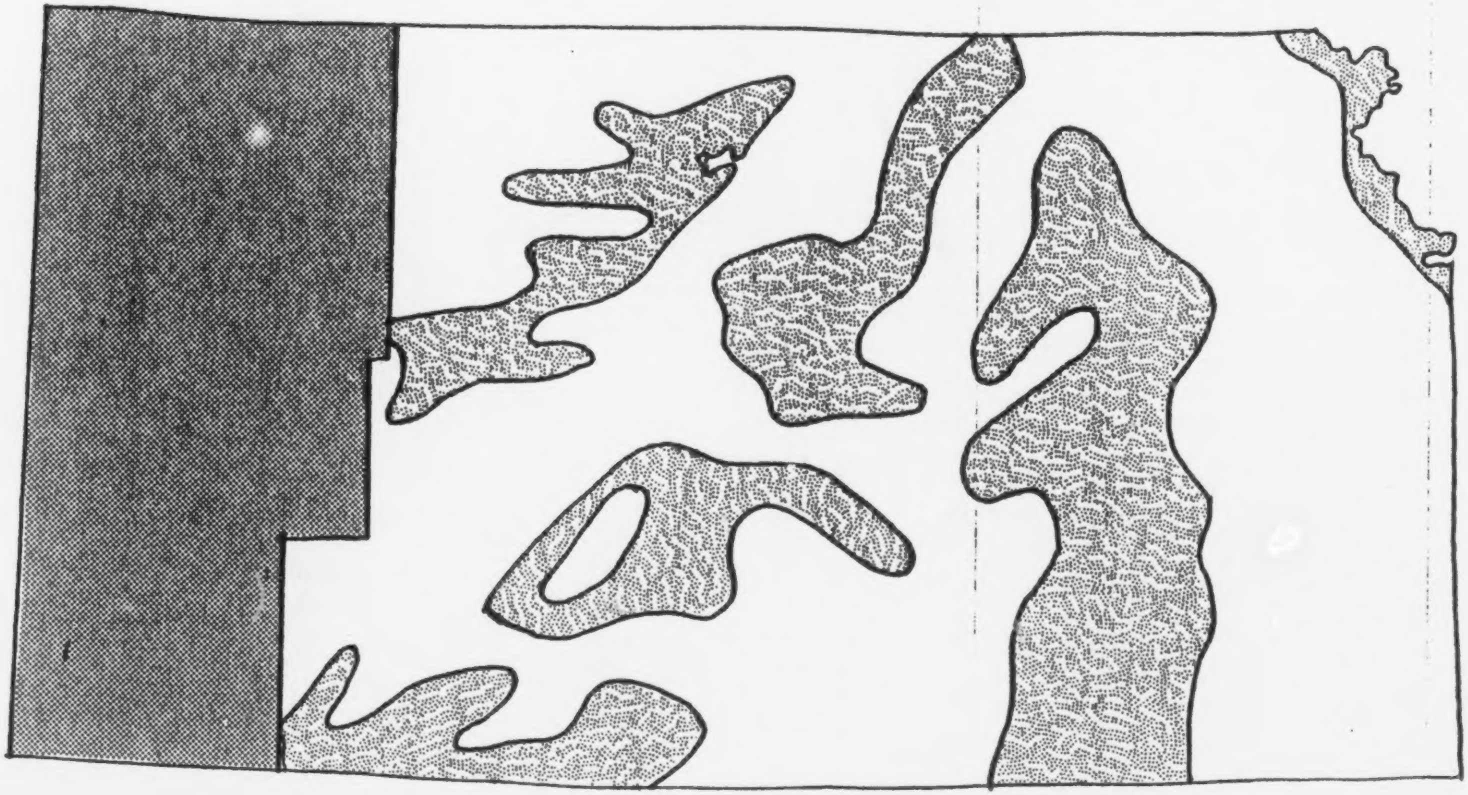
Overall, Kansas climate is considered to be subhumid. The growing season varies from 150 days in the northwest to 200 days in the southeast. Rainfall averages 40 inches in the extreme eastern part of the state to 15 inches in the far west (see figure D), but in any year it can vary widely from the norm. Fortunately for crop production, 70 to 80 percent of the average rainfall falls during the growing season, from April to September.[6]

Due to the rainfall patterns and the resulting runoff, eastern Kansas has more and bigger streams than western Kansas and about 12 million acre-feet of water flow out of the state each year[7] (see figure E). An acre-foot is that amount of water which would cover one acre to a depth of one foot, or 326,000 gallons. Kansas has more than 250 million acre-feet of water stored underground.[8] Most of this water underlies western Kansas in areas where the underground material is sand and gravel which can hold large amounts of water (see figure F). Irrigation wells dot western Kansas. In most areas of intensive irrigation, water is being withdrawn at a much faster rate than it can naturally recharge itself through the process of rainfall percolating down to the underground aquifer. The water table, actually the saturated thickness of the material below, is declining in these areas, creating serious problems and concerns for the future.

Figure C

GENERAL PRIME FARMLANDS MAP

KANSAS



☐ 50% or more of area is prime farmland

▨ Less than 50% of area is prime farmland

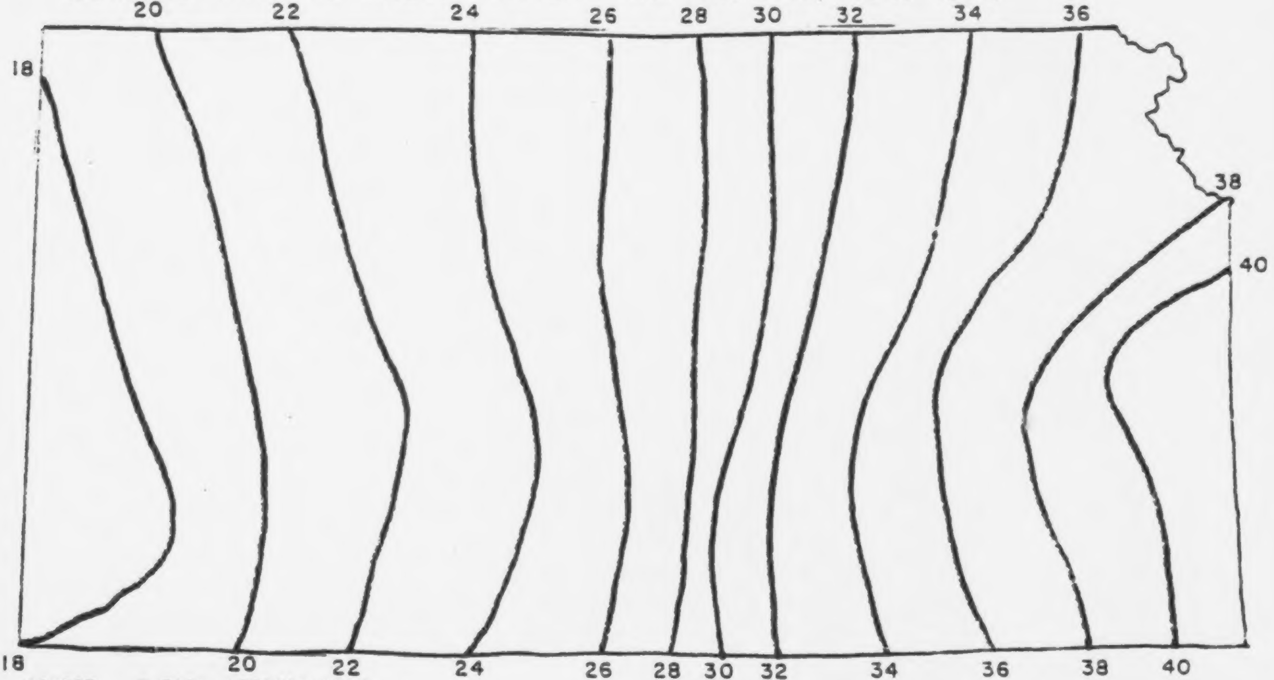
▩ No prime farmland (dryland)

Source: Family of Maps S.C.S Drwg.No.5,S-32,550 (REV. 1-76), and information from SCS Field Personnel.

Albers Equal Area Projection, USDA-SCS, Lincoln, Nebraska, 1980.

Figure D

NORMAL ANNUAL PRECIPITATION FOR KANSAS, 1941-1970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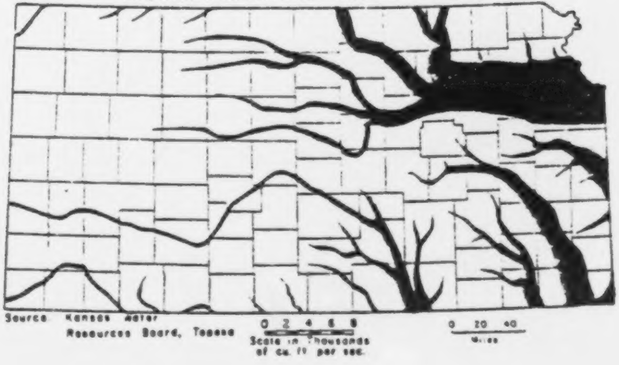
SOURCE: L. D. BARK, METEOROLOGIST
AGRICULTURAL EXPERIMENT STATION
KANSAS STATE UNIVERSITY

Precipitation in inches

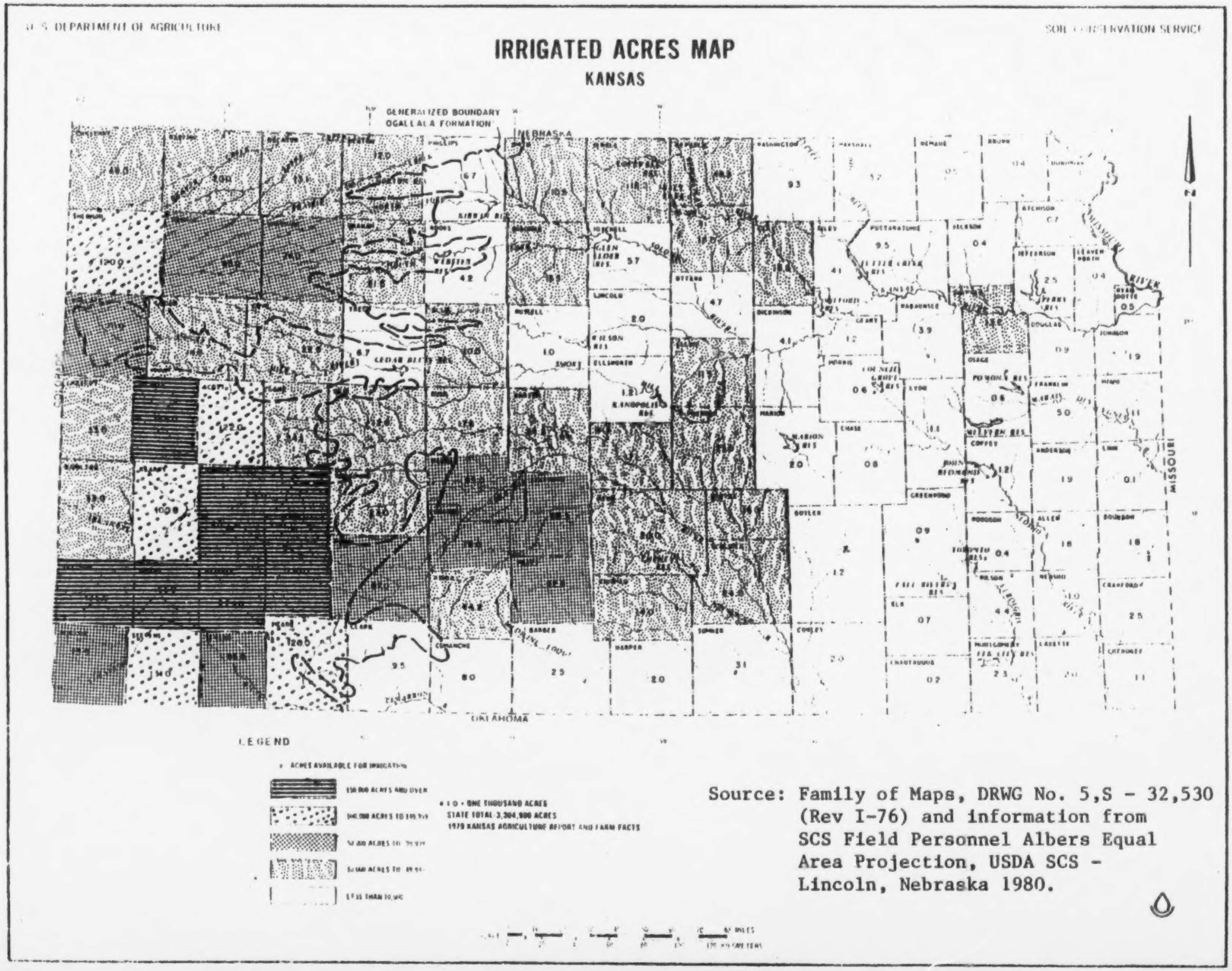
Figure E

AVERAGE ANNUAL STREAMFLOW IN KANSAS


0 2 4 6 8
Scale in Thousands of cu. ft per sec.
0 20 40
Miles

Source: Kansas Water Resources Board, Topeka

Figure F


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
IRRIGATED ACRES MAP
KANSAS
GENERALIZED BOUNDARY OGALLALA FORMATION
NEBRASKA
OKLAHOMA
MISSOURI
LEGEND
ACRES AVAILABLE FOR IRRIGATION
150,000 ACRES AND OVER
LESS THAN 10,000
1.0 = ONE THOUSAND ACRES
STATE TOTAL 3,304,000 ACRES
1979 KANSAS AGRICULTURE REPORT AND FARM FACTS

Source: Family of Maps, DRWG No. 5,S - 32,530 (Rev I-76) and information from SCS Field Personnel Albers Equal Area Projection, USDA SCS - Lincoln, Nebraska 1980.

KANSAS FOOD PRODUCTION

Kansas is a leading producer of grains and meat for the United States and an important granary for the developed world. Production has increased tremendously since World War II as abundant and inexpensive sources of energy have allowed for highly mechanized farming operations, dramatic increases in agricultural chemicals, and irrigation. Chemical fertilizer has been the most important energy-intensive input for increasing Kansas food production. High crop yields in both dryland and irrigated acreages are dependent upon high levels of soil nitrogen which has recently been provided almost entirely through chemical fertilizers.

The Kansas Agricultural Experiment Station reported that Kansas farmers need continued access to moderately priced chemical fertilizers if they are to sustain high levels of production in the future.[9] We may not be able to continue our current level of production considering that our nitrogen fertilizer consumption (909,000 tons in 1980[10] which cost $180 million [11]) requires a tremendous amount of natural gas which is a limited resource and is expected to become more expensive.

Farms have become larger, increasing in size 236 percent since 1930, and averaging 664 acres in 1980.[12] These large farms have become extremely specialized with only five cultivated crop species--wheat, sorghum, corn, alfalfa, and soybeans--accounting for more than 95 percent of the value of harvested crops in Kansas.[13] And the majority of that production (about 58 percent) is used for livestock and another 39 percent is exported from Kansas for human consumption.[14]

Kansas can have a more diversified agriculture. In addition to our standard crops, farmers have at times successfully and profitably grown flax, castor beans, tobacco, cotton, hemp, broomcorn, cowpeas, oats, rye, barley, potatoes, sweet potatoes, apples, and peaches; and raised sheep, chickens, and turkeys. Some of these commodities are still grown in our state, but their importance has declined. Some farmers are now experimenting with sunflowers, rapeseed, and other speciality crops. Kansas State University is doing research on crops like pearl millet. Many of these crops may not be practical on large acreages, some are not currently as profitable as others, but all of them could be grown in parts of Kansas.

A comparison of two farms in Dickinson County, near Abilene, can highlight some changes in crop diversity that have occurred in central Kansas agriculture. A statistically average farm for 1881 in Dickinson county consisted of 160 acres, grew 50 acres of wheat, 36 acres of corn, one acre of potatoes, 3 or 4 acres of other crops, kept 4 horses or mules, 7 or 8 head of cattle, 12 hogs, 6 sheep, and had an orchard of 30 apple trees, 60 peach trees, 12 cherry trees, some plum and pear trees, and raspberry, gooseberry, and blackberry bushes, and some grape vines.[15]

In 1981, one century later, a statistically average Dickinson County farm had increased to 455 acres, had 161 acres of wheat, 47 acres of sorghum, 8 acres of corn, 15 acres of alfalfa, 15 acres of other hay, and 10 acres of other crops, kept 57 head of cattle, 21 hogs, 3 sheep, and 17 chickens.[16] No records are now kept on orchards and berry bushes, but they are probably insignificant. It should be noted that due to current production techniques with larger fields, the 1980 farm becomes more diversified through statist[illegible] han it actually is.

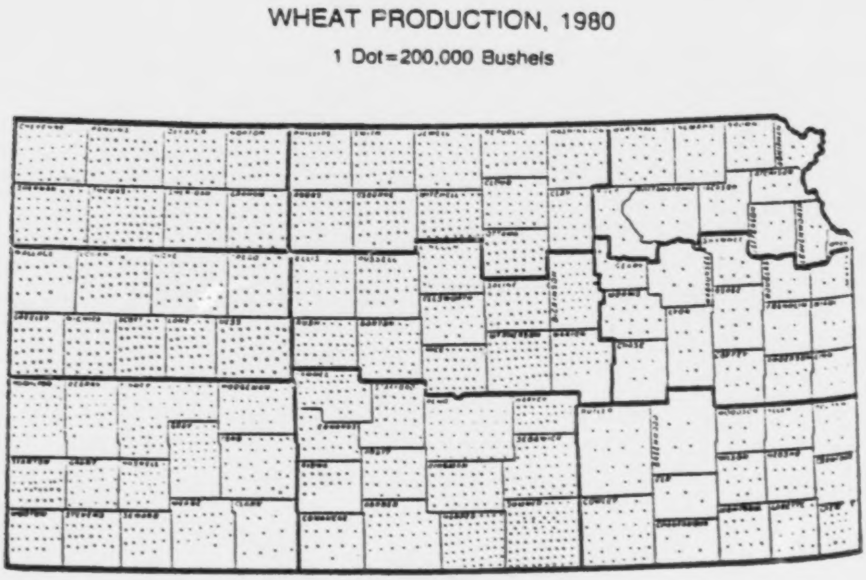
This comparison points out that a better diversified agriculture was and is possible. As the energy cost of our current food system increases and as local food production becomes more economically competitive, Kansas agriculture can diversify to meet more of our own needs. This is not to deny the fact that we have the capability of feeding others too. We can produce for both ourselves and others.

Wheat

Winter wheat is highly suited to the subhumid environment of Kansas. Planted in the fall, it makes rapid growth in the usually cool and moist spring and matures in the early heat of summer. Mennonite farmers introduced hard red winter wheat into Kansas in the late 1870's which helped set the stage for Kansas becoming the "Wheat State". In 1980 Kansas led the nation in wheat production with a record wheat crop of 420 million bushels, harvested from 12 million acres, and worth $1.6 billion to Kansas farmers (see figure G).

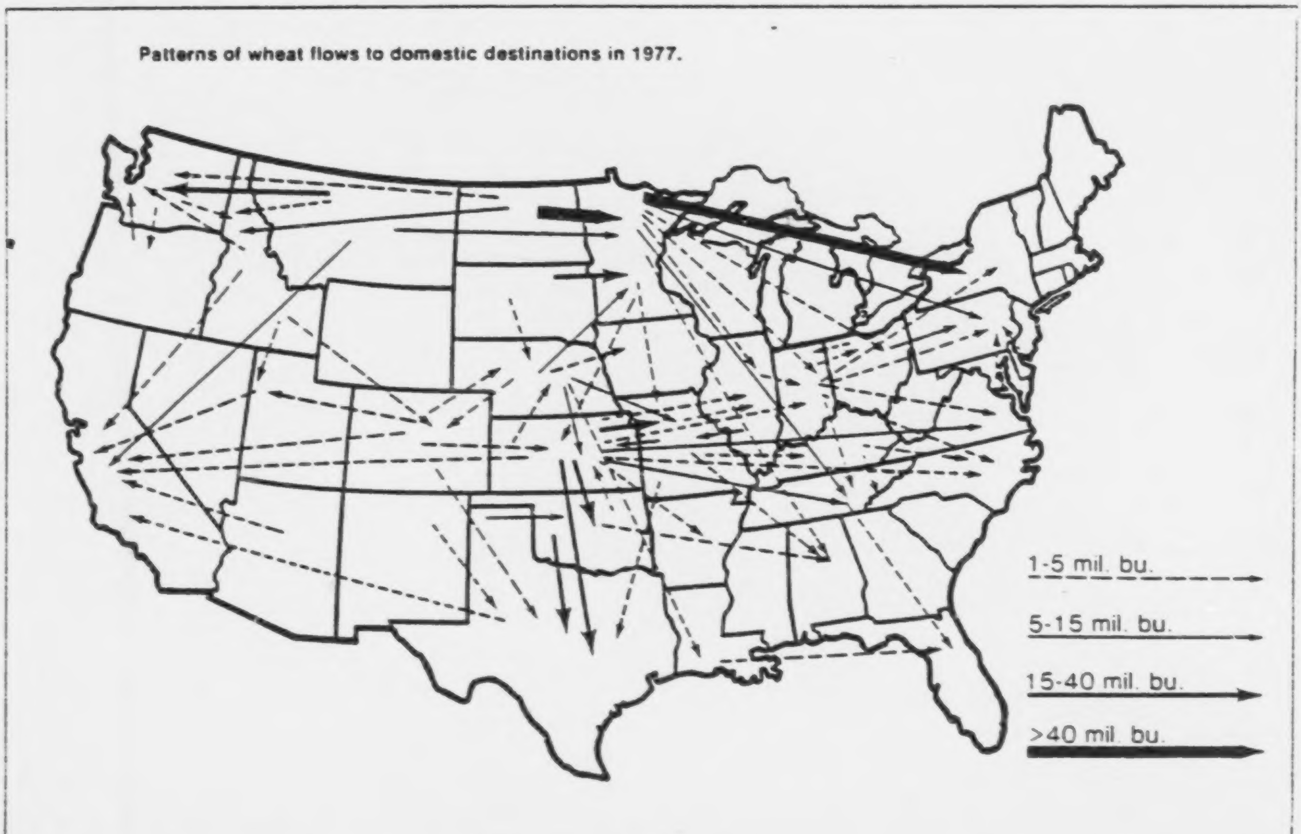
Wheat is important to human nutrition because it contains generous amounts of carbohydrates and certain vitamins and minerals. It is planted on more acres worldwide than any other grain. Wheat commands the leading price for cereal grains because of its human nutritional value. About 75 percent of the U.S. crop is used directly for human food. Only the flour milling by-products of bran, germ (the most nutritious part of a wheat kernel, and shorts which comprise about 25 percent of whole grain wheat, are fed to livestock.[17]

Figure G


WHEAT PRODUCTION, 1980
1 Dot=200,000 Bushels

Source: 64th Annual Report and Farm Facts 1980 (Topeka: Kansas State Board of Agriculture, 1980)

Figure H


Patterns of wheat flows to domestic destinations in 1977.
1-5 mil. bu.
5-15 mil. bu.
15-40 mil. bu.
>40 mil. bu.

Source: Mack N. Leath, Lowell D. Hill, and Stephen W. Fuller, Wheat Movements in the United States (Champaign: University of Illinois Agricultural Experiment Station, 1980).

Wheat exports are important in the balance of payments for the U.S. and are a boon to the Kansas economy. Two out of three acres of wheat harvested in Kansas are destined for foreign export.[18] The slogan "a bushel of wheat for a barrel of oil" may be somewhat out of proportion, but is essentially what happens in U.S. world trade.

About 95 percent of the wheat grown in Kansas is shipped out of the state.[19] Most of it is shipped out as whole grain but some is also shipped out as flour (see figure H). Approximately one-fifth (or 82 million bushels) of the Kansas wheat crop is ground in Kansas mills.[20] Until the 1960's many mills were located in wheat production areas of the United States, but because advances in technology which altered the structure of transportation, new grain mills are now located closer to major consumption centers and away from Kansas.[21] Nonetheless, Kansas still leads the nation in milling capacity with 12,425,000 pounds per day.[22] In 1890 there were 400 flour mills in Kansas which produced 10 million barrels of flour per year,[23] now there are only 19 large mills left in Kansas. There has been substantial centralization in the milling industry nationwide, with the 10 largest companies controlling 71 percent of the industry's total wheat flour capacity.[24]

The average Kansan consumes 119 pounds of flour, bakery products, and wheat cereal per year.[25] This accounts for 274,000,000 pounds of wheat, only one percent of the 1980 Kansas crop. More wheat, approximately 780 million pounds or 3 percent of the wheat crop, is used for seed for the next crop.[26]

Kansas is the breadbasket for our country and the rich nations of the world. Along with the export of grain, we are also exporting our soil's fertility. This is returned for the most part by energy-expensive fertilizers. Also, during seed bed preparation, wheat production practices expose the soils to the erosive forces of wind and water. However, when compared to other crops, wheat has one of the most favorable energy input/output ratios of major crops grown. It requires only moderate amounts of fertilizer, no cultivation, and normally little pesticide use. Wheat production practices that are productive and sustainable are not only possible but necessary for our nation's breadbasket to remain full.

Corn

Corn was the first grain crop grown in Kansas and is the highest yielding, averaging 94 bushels per acre in 1980. Total production for 1980 was 116,560,000 bushels worth $396,304,000 to Kansas farmers.[27] Corn is an important feed grain for livestock—80.5 percent of the 1980 crop was fed to livestock.[28] Farmers grew an additional 426,000 acres of corn that was harvested for livestock feed as corn silage.

The increase in deep-well irrigation in the western part of Kansas has resulted in a shift of corn acreage to the West. In 1972, the first year that the Board of Agriculture kept statistics on irrigated corn acreage, 573,400 of the total 1,240,000 acres (46.2 percent) were irrigated.[29] This increased to 958,000 irrigated corn acres (77.3 percent) by 1980.[30] Most of this increase came in the western third of the state. Irrigated corn produces higher yields than dryland corn and by 1980, 77.3 percent of the entire Kansas crop came from irrigated acreages in the western third of the state.[31]

Paralleling the increase in corn production in western Kansas has been the rise of cattle feedlots and packing plants. This is offset by a sinking water table. Corn acreages have started to decline in western Kansas because more water-conserving crops, such as wheat and grain sorghum, are being planted when increased pumping costs make corn less profitable than these crops (see figure I).

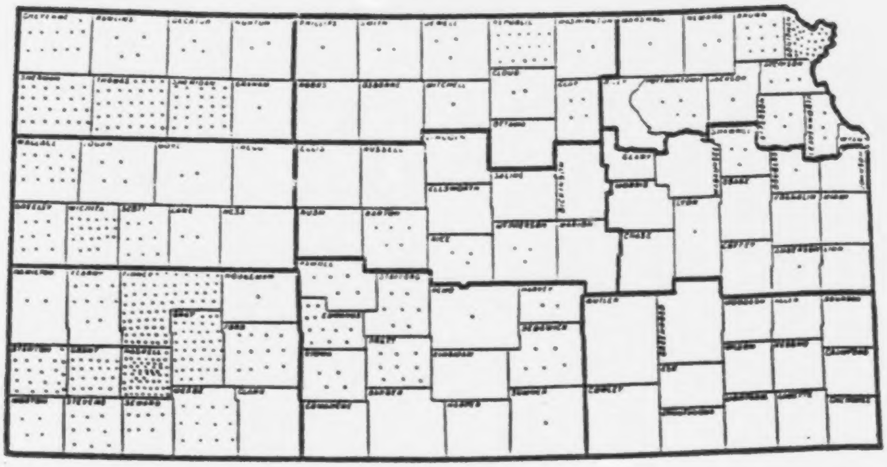
Corn requires more fertilizer per acre than any other grain crop grown in Kansas. This is necessary to obtain the highest potential yields. Corn is a row crop, and when planted on slopes, is highly susceptible to soil erosion. Of all crops grown in Kansas, corn has the largest percentage of its plant acreage treated for both weed and insect control. Of the 1.82 million acres of corn planted in 1978, 86 percent were treated for weed control and 81 percent were treated for insect control. A total of 6,463,000 pounds of herbicides and 2,627,000 pounds of insecticides were used on corn in 1978.[32]

Kansans each consume about 17.8 pounds of cornmeal, cereal, cornstarch and hominey grits per year, or 37 million pounds total.[33] However, this only accounts for 0.6 percent of the acreage planted in Kansas for the production of grain. There are two large cornmeal mills in the state which sell cornmeal nationally and internationally.

Grain Sorghum

Grain sorghum or milo is second to corn in value as a feed grain and was grown on more acres--3,640,000--than any other Kansas crop besides wheat[34] (see figure J). Kansas is second only to Texas in sorghum production and produced 31.5 percent of the U.S. crop in 1977.[35]

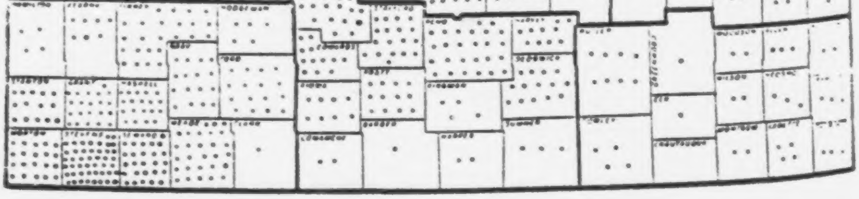
Figure I



CORN GRAIN PRODUCTION, 1980

1 Dot=200,000 Bushels

Figure J



SORGHUM GRAIN PRODUCTION, 1980

1 Dot=200,000 Bushels

Source: 64th Annual Report and Farm Facts 1980 (Topeka: Kansas State Board of Agriculture, 1980)

In 1980, farmers produced 156,520,000 bushels with a farm value of $460,170,000. Grain sorghum is almost as high yielding as corn, but is much more drought tolerant. It is highly suited for the Great Plains climate with the states of Texas, Kansas, and Nebraska producing 80 percent of the U.S. crop.[36] Almost the entire production of grain sorghum is for livestock feed. It is fed to cattle in Kansas at about an equal rate to corn and large amounts are used in the feedlots of southwest Kansas. In 1980, beef cattle in Kansas consumed 78,826,000 bushels of grain sorghum or the equivalent of one out of every two acres harvested.[37] In addition, 760,000 acres of sorghum silage and forage were grown in 1980 and fed to livestock.[38] In 1977, about 40.7 percent of the crop was shipped outside of the state to be fed elsewhere.[39] The foreign export accounted for 17.6 percent of the 1977 crop.[40]

Grain sorghum is a row crop like corn and is grown under similar production techniques. It can be grown further west than corn without irrigation, and requires less irrigation for high yields. Grain sorghum is commonly being grown on irrigated acreages of western Kansas. Because of its large acreage and the production techniques used, grain sorghum requires more pesticides than any other crop grown in Kansas. In 1978, 9,001,900 pounds of herbicides and 1,625,800 pounds of insecticides were used on sorghum acreages.[41]

Other Grains

Oats, barley, and rye are all grown in Kansas as minor crops. Their acreages have decreased since the 1940's as they are not normally as profitable or useful as wheat or feed grains. Almost all of their production is for livestock feed. If the direct human consumption of these grains were met by 1980 Kansas production, only 3.4 percent, 2.4 percent, and 1.4 percent of the current acreages of these grains (189,000 acres total) would be needed.[42]

Popcorn production for 1980 on 4,200 acres was 8,990,000 pounds.[43] Popcorn is produced entirely for human consumption, and Kansans consumed 2.5 pounds per person or 5,856,760 pounds in 1980.[44] Kansas ranked 9th in the nation in popcorn production and exported 30 percent of its crop.[45]

Beans

Soybeans are an important and valuable crop for Kansas. They are crushed for oil and the meal is used for livestock feed. In 1980, a low year for production, 1,450,000 acres of soybeans yielded 23,925,000 bushels worth $181,830,000 to Kansas farmers.[46] Soybeans are grown primarily in the eastern part of the state where rainfall is usually adequate, although some are grown in the central part of the state and some are irrigated in western Kansas. In 1980, the eastern third of Kansas had 85.2 percent of the soybean acreage harvested and 81.1 percent of the total yield.[47]

Most soybeans grown in Kansas are crushed for oil at four large processsing plants within the state. Oil extraction from soybeans is 17.9 percent and is used primarily as a vegetable oil in various forms for human consumption.[48] The remaining meal is very high in protein and is a valuable livestock feed supplement. There is also some soybean flour that is milled in Kansas for human consumption. Kansas per capita consumption of soybeans amounts to 2.0 pounds of soy flour per year and 22.7 pounds of oil per year.[49] Only 22 percent of the Kansas soybean acreage is needed to supply this demand.

Kansas livestock consumed the equivalent of 740,980 acres of soybeans in their feed rations for 1980.[50] This accounted for 51.1 percent of the total acreage. The remaining production of soybeans is shipped to other parts of the country as beans, oil, and feed, and some (about 8.6 percent in 1977[51]) is exported to foreign countries.

Soybeans are a legume, and with the help of rhizobium bacteria are able to supply their own nitrogen needs. They are usually grown as a row crop like corn. Soybeans have the least plant residue of all harvested crops, and their fields are the most subject to erosion. In 1978, about 78 percent of the 1.48 million acres of soybeans planted were treated with herbicides, while only 2 percent were treated with insecticides.[52]

Twenty-four thousand acres of dry beans, mainly pinto beans, were harvested in 1980, producing 33,600,000 pounds of beans.[53] They were grown on irrigated ground in western Kansas. Kansans consumed 15,311,000 pounds of dry beans in 1980[54] and 54.4 percent of the Kansas acreage is needed to produce this amount.

Alfalfa and other Hay

Alfalfa was grown on 1,000,000 acres and produced 2,850,000 tons in 1980.[55] Alfalfa is grown throughout the state, with the greatest production in the central part of the state. Most production is dryland, especially along stream bottoms, but some is irrigated in the western part of the state. Alfalfa is a nutritious animal feed and is rich in protein. Most alfalfa is sun-dried and baled for feed. Some was used green chopped, and dehydrating plants dried or ground into meal a total of 267,300 tons of sun-cured alfalfa.[56]

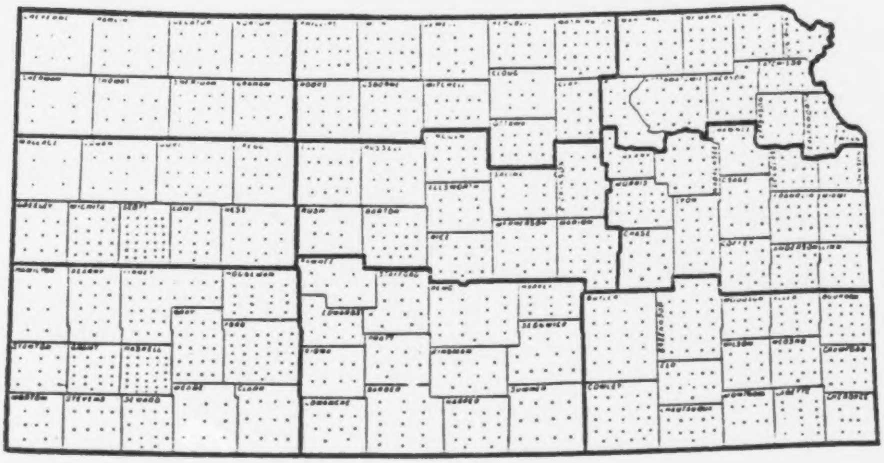
Alfalfa is a restorative crop to the land. It is a legume and with the help of bacteria, it makes nitrogen available to plants. It is also a perennial and effectively stops soil erosion on the land it is growing on. It is grown in solid stands and usually requires no herbicides or pesticides. In 1978, only 6 percent of the acreage was treated for weed control and 13 percent for insect control.[57]

Native prairie hay, red clover hay, bromegrass hay, and other hay were harvested from another 1.2 million acres, producing 1,380,000 tons of hay in 1980.[58] These hay crops are highly nutritious animal feed. Being perennials, they can help stop erosion. Native prairie hay is a valuable resource from areas of the tall grass prairie that never yielded to the plow, with most of this acreage concentrated in the Flint Hills of eastern Kansas. Red clover is a tame leguminous hay and like alfalfa is valuable for more than just its hay. When used in long-term rotations it enriches the soil and disrupts weed and insect pest populations.

Beef

Kansas is a tremendous producer of beef. Production for 1980 was 2 billion pounds from commercial slaughter plants, ranking Kansas fourth in the nation in red meat production by commercial slaughter plants.[59] The beef industry in most years is the basis for the financial success of most Kansas farms, either directly through cattle sales or indirectly through feed grain production which will be fed to cattle. As of January 1, 1981, Kansas had 6,450,000 head of cattle on farms and in feedlots, ranking 4th in the nation.[60] There are more cattle than people in Kansas, with about 2.74 head of cattle for every person (see figure K). This gives a good indication of the importance of cattle to

Figure K



ALL CATTLE AND CALVES JANUARY 1, 1981

1 Dot=5,000 Head

Source: 64th Annual Report And Farm Facts 1980 (Topeka Kansas State Board of Agriculture, 1980).

the Kansas economy. Cattle and calf production were worth $2.8 billion to Kansas farmers in 1980 and accounted for 34.3 percent of the total value of farm production for 1979.[61]

Kansas has a long history of cattle production. At first cattle grazed on the open range and were driven from the ranges in Texas in the 1870's and 1880's to the railheads at cowtowns such as Abilene, Ellsworth, Dodge City, and Wichita. As more farmers came to the state, the open range was closed, resulting in disputes between farmers and ranchers. However, farmers and ranchers are dependent on one another.

Approximately 15.7 million acres of Kansas cropland (51.9 percent) were used in 1980 to feed livestock.[62] There are about 16.3 million acres of rangeland in Kansas, composed of native grasses and forbs. This rangeland supports the cow-calf operations that produce the heifers, steers, and bull calves for the feedlots, that in turn, fatten these livestock primarily with Kansas-grown grains. This rangeland acreage accounts for 33 percent of all Kansas farmland. Another 6 percent is pasture planted primarily in tame grasses.[63]

The growth of the beef industy in Kansas has paralleled the increase of feed grain production, especially the rapid development of irrigated feed grains in southwestern Kansas. Kansas-fed marketings increased from 498,000 head in 1955 to 2.4 million head in 1972, and to 3.4 million head by 1978.[64] Since then, they have declined to 3.0 million in 1980.[65] Although cattle production is distributed across the state, it is concentrated in southwest Kansas where the largest feedlots are located. In 1979, 45 percent of the state's total grain-fed marketings were from the southwestern district of Kansas and 70 percent were from the western third of the state.

The fattening of beef cattle for slaughter is becoming a monopoly for a few very large feedlots in southwestern Kansas. These feedlots are directly dependent on irrigation water from the Ogallala Aquifer to irrigate feed grains and alfalfa. Most beef cattle slaughtered in commerical packing plants are fattened with grains to produce a highly marbled meat which meets USDA marketing standards and consumer preference for a rich and tender meat. Of the 3 million head of grain-fed cattle marketed in Kansas in 1980, 91 percent were fattened for slaughter in commercial feedlots.[66]

Even feedlot production is concentrated in the hands of a few. There are 66 feedlots in Kansas that have a capacity of over 10,000 head, 39 of them are located in western Kansas and 27 are in southwestern Kansas. Southwestern Kansas has 53.4 percent of the total feedlot capacity for the state.[67] The three largest feedlots are located in southwest Kansas and have a combined total capacity of 168,000 head of cattle.[68] Feedlots are not always full, but have considerable turnover and the eight largest Kansas feedlots marketed a total of 638,000 head in 1981.[69]

Most of the beef grown in Kansas is slaughtered in Kansas packing plants. In 1977, there were 64 packing plants in the state.[70] Since that time, the largest packing plant in the world and the region has been built in southwest Kansas near Garden City. About 20 percent of the beef that Kansas packing plants process comes from out of state.[71] Kansans consume 76.5 pounds per capita each year which amounts to 180 million pounds of beef.[72] With current production techniques this amount of production requires 444,000 acres of cropland (not including rangeland and pasture) to grow feed grains, hay, and silage.[73] However, about 89 percent of the Kansas-produced beef processed by commercial packing plants is shipped out of state, requiring 3.5 million acres of feed grains, hay, and silage for this export production.[74]

The beef industry has been the most important agricultural industry in the state in recent years. It will probably continue to remain strong, but may be in for some hard times. Consumers are buying less beef in favor of other meats because of health concerns and because other protein sources are less expensive. World food needs are expected to increase 100 percent by 2020; in the U.S. an increase of 50 percent is expected. Feed grains will find more competition with food grains and both will probably increase in price, making the cost of beef disproportionately more expensive, since it takes about 8 pounds of grain to make one pound of retail meat in Kansas (see figure L). Also, as the Ogallala Aquifer is lowered further and as the price of energy continues to increase, feed grains will find even further competition with food grains in the feedlot areas of western Kansas.

Kansas grasslands have come under heavy grazing pressure as the breeding grounds for Kansas feedlots. Many acres have been degraded, as unpalatable and undesirable species such as musk thistle, ragweed, ironweed, and various trees and shrubs in eastern Kansas have increased. According to the 1977 Kansas Resource Inventory, 57 percent of the grassland in the state needs conservation work.[75] Most of the undesirable species have been caused by overgrazing or improper range management. In 1978, 2.5 million acres of Kansas rangeland were sprayed with herbicides (principally 2,4-D and 2,4,5-T) to combat these undesirable species.[76]

Figure L

Grain Utilization for Beef

	Pounds Grain Equivalent Per Cow		
	Prevalent	Potential	If Necessary
Cow	300	100	50
Bull	25	10	5
Creep	150	-	-
Replacements	125	30	20
500-700 #	900	400	175
700-1000 #	2100	1200	200
	3600	1740	450
# grain/# live wt.	3.6	1.74	.45
# grain/# retail meat	8.0	3.9	1.0

* Calculations based upon 1000 lbs. live weight and 450 lbs of retail cuts.

Misconceptions:

1) Efficiency of grain use is often quoted only for finishing phase.
2) Approximately 45% of grain equivalent would not be suitable for human food. Examples are grain by-products and damaged or contaminated grain.
3) Who will bear cost of transporting grain to needy world population?
4) If priorities for use are to be established, what will be done about pet food and horse feed!

Source: Jack Riley, Animal Science Department, Kansas State University.

Despite some drawbacks, the beef industry has a definite future in Kansas. The prairies evolved with grazing animals, and if properly managed, are a sustainable meat-producing resource. Beef cattle don't have to be fed grains that are potential human foods. If necessary, beef cattle can be raised in Kansas using one pound of grain per pound of retail meat produced (see figure L). This is possible because cattle can utilize pasture crops, eat large quantities of roughage, utilize cash crop by-products, and eat damaged or contaminated grains that are unfit for human consumption.

Beef cattle also produce manure which is valuable as a fertilizer and soil conditioner. Some cattle feeders recognize this resource and return it to their fields or sell it for others to use. Other feeders look upon manure as a waste product and not the valuable resource it really is. In 1974, beef cattle produced 3.4 million tons of manure in Kansas of which 55 percent or 1.8 million tons were considered to be economically recoverable. This would amount to 82 pounds per acre of cropland and pasture in Kansas. Total nutrients from this waste are 118,000 tons of nitrogen worth \$11.2 million in 1980, 56,000 tons of phosphorus worth \$6 million, and 116,000 tons of potassium worth \$9.6 million.[77]

Pork

The current trend in the pork industry is toward very large confinement operations that are removed from the traditional diversified farm enterprise which feeds grain produced on the farm to hogs. This trend has been accelerated by tax policies and research which have encouraged large confinement feeding operations.[78] The Kansas pork industry has followed the trend with the 38 largest commercial feeders having a maximum capacity of 192,000 head (over 5,000 head per feedlot)[79] with more than one generation per year.

There were 1,635,000 market hogs raised in 1980 and 265,000 breeding head with a combined market value of $123,500,000 (see figure M). Pork production from slaughter plants was 257 million pounds retail weight. Kansans consumed 161 million pounds in 1980 or 68.3 pounds per person.[80] About 37.5 percent of Kansas pork production was shipped out of the state. Cropland required to feed hogs (corn, grain sorghum, and soybeans) totaled 635,000 acres.[81]

Lamb and Mutton

In 1980 Kansas had 200,000 head of sheep, but only produced 259,000 pounds of retail weight lamb and mutton.[82] Almost the entire production was shipped out of the state to be slaughtered because there are no large processing plants in Kansas. When compared to the 1980 consumption of 3,062,000 pounds (1.3 pounds per capita),[83] 91.5 percent of consumption was imported. Cropland required for sheep production was 13,000 acres, not including pasture or rangeland.

Dairy

The Kansas dairy industry is strong and has a greater percentage of its production used locally than any other agricultural sector in the state (see figure N). This can be attributed to milk being a perishable commodity and quite heavy, making transportation expenses high. The Kansas dairy industry is a family farm enterprise much more so than production of other livestock in the state because there is a very strong USDA Dairy Support Program which has not encouraged the centralization of this industry.

Figure M

ALL HOGS AND PIGS, DECEMBER 1, 1980

1 Dot=2,000 Head

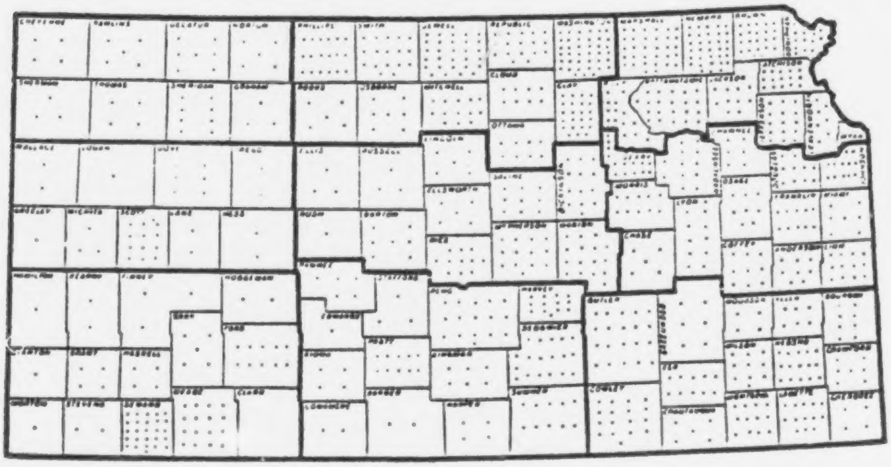
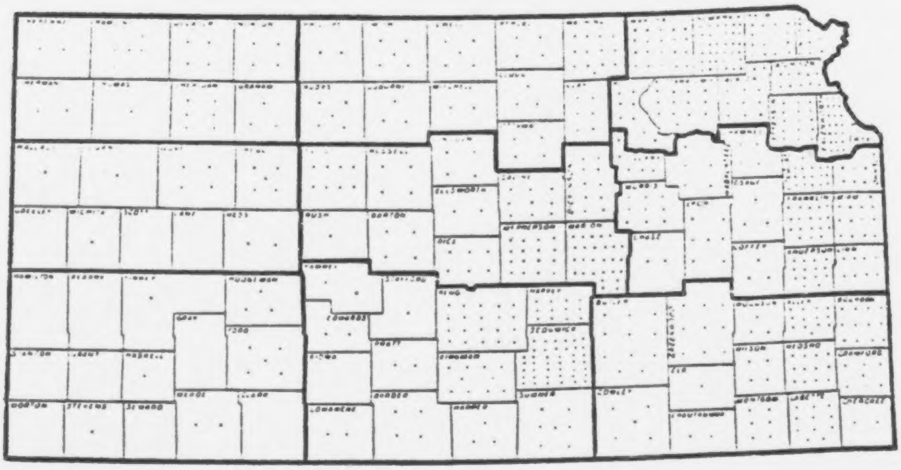


Figure N

MILK PRODUCTION, 1980

1 Dot=2,000,000 lbs.



Source: 64th Annual Report and Farm Facts 1980 (Topeka: Kansas State Board of Agriculture, 1980)

In 1980, there were 123,000 milk cows on 6,200 farms. They produced 1,355 million pounds of milk or 11,000 pounds per cow which was worth $175 million to farmers.[84] This milk was sold primarily to the 27 bulk milk and cheese processing plants in the state.[85] For the most part, production and consumption of dairy products are about equal, with the state exporting a minor share. In 1980, Kansas per capita consumption of dairy products was 294 pounds.[86] Feeding the 123,000 head of milk cows required 361,000 acres of cropland to produce grain, hay, and silage.[87]

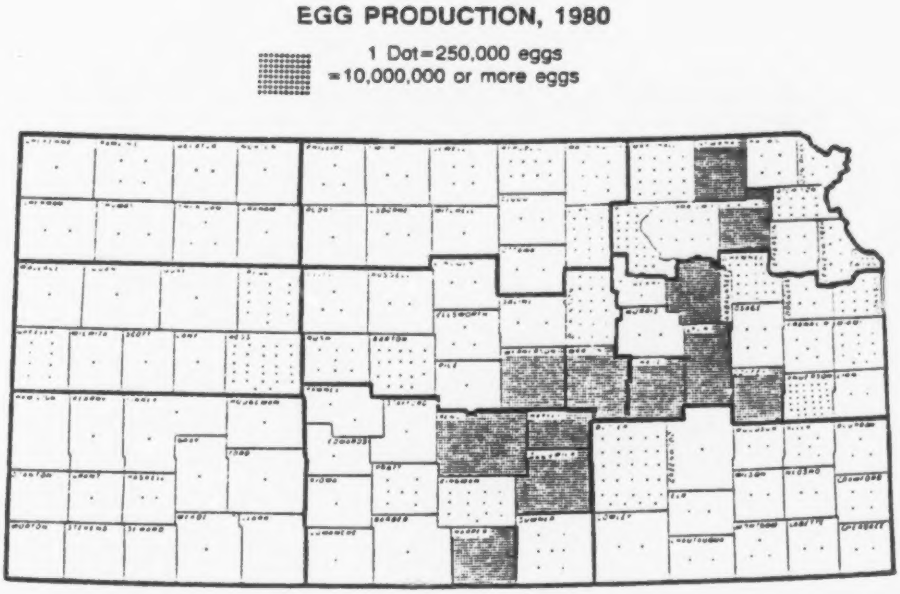
Poultry

The poultry industry has been declining in Kansas since the 1940's. Over 90 percent of the chicken and turkey that Kansans consume is imported into the state. Egg production has also declined, but Kansas egg production still accounts for 68.4 percent of consumption. The poultry industry has become centralized with tens of thousands of caged birds not uncommon for one operation; several operations have over 100,000 birds (see figure 0). Egg production is not entirely a farm enterprise as Cargill, a multinational corporation, supplies the feed and owns the birds that lay half of the eggs in Kansas.[88]

Fish

Kansas fish production is a small but growing source of meat for Kansans with potential for expansion. In 1980, about 1,646,000 pounds of dressed fish, mainly catfish, were raised and another 373,820 pounds of commercial rough fish were harvested by commercial fishermen in the Missouri River

Figure O


EGG PRODUCTION, 1980
1 Dot=250,000 eggs
=10,000,000 or more eggs

Source: 64th Annual Report and Farm Facts 1980 (Topeka: Kansas State Board of Agriculture, 1980).

and other Kansas waters.[89] A new program has been established for netting fish commercially in selected reservoirs across the state. Kansans' consumption of fish in 1980 was 29,900,000 pounds or 12.7 pounds per person.[90] Ninety-three percent of our consumption was imported.

Wild Game

The harvest of wild game is a substantial, but often overlooked food source for Kansans. In 1980, over 10,300 whitetail and mule deer were harvested, 972,000 pheasant, 1,186,000 quail, 200,000 ducks and 10,000 geese (in an off-year for waterfowl).[91] Wild game harvested in Kansas in 1980, even when priced conservatively, was worth at least $5.3 million (estimated at $2.00 per pound).

Vegetables

Kansas has a history of substantial vegetable production. But while Kansas population has increased, there has been a decrease in the production, acreage, and variety of vegetables grown in Kansas. In 1930 there were 56,732 acres of commercially-grown vegetables in Kansas. This has dropped 87 percent to only 7,265 acres in 1980 (see figure P). Potatoes have continued to remain the dominant vegetable crop.

Kansas was a major potato growing area for the U.S. up to the 1950's when the Kaw (Kansas River) Valley potatoes were marketed in early summer before the main northern crop was ready for harvest. Potatoes were shipped by the thousands of train carlots to eastern markets. A farmers cooperative marketing association was active from 1930 to 1936 and in 1931, shipped 71 percent of all the potato carlots leaving the Kaw Valley.

The Kaw Valley potato industry declined for reasons that are not entirely clear, although competition from California growers and several

Figure P Selected Vegetable Production

Vegetable	Acreage		
	1920	1930	1980
Asparagus	115	441	0
Beans, Snap	191	553	100
Cabbage	527	696	350
Carrots	8	48	0
Celery	13	19	0
Cucumbers	142	357	85
Eggplant	0	0	85
Lettuce	99	125	0
Onions	344	442	50
Potatoes	47,246	42,310	1,650
Peas (green)	167	129	0
Peppers	29	40	85
Radishes	25	18	0
Spinach	11	225	250
Sweet Corn	1,633	2,871	3,000
Tomatoes	1,867	2,668	110
Turnips	64	87	700
Horseradish	12	128	0
Parsnips	24	7	0
Sweet Potatoes	4,366	3,583	800
Mixed Vegetables	521	969	0
Other Vegetables	70	285	0
TOTALS	57,784	56,732	7,265

Source: 1920 and 1930 figures from "A Chronological Comparison of Agricultural Census Data by Crop Reporting Districts in Kansas--1900 to 1935," W.P.A. Projects Administration of Texas. 1980 acreages are from James Greig, Kansas State University, Department of Horticulture.

severe floods were contributing factors. However, with changing economics, increased energy expenses, and support of local production, the Kansas potato crop may bloom again. A Kansas State University horticulture professor has stated:

> We are finding at the present time that in many instances over half the value of potatoes is tied up in fuel costs in transporting them from the areas of production to the area of use. It makes relatively little sense to grow potatoes in California or other areas of the West, ship them to Kansas and waste all that money in declining fossil fuel reserves.[92]

One area that could rapidly develop into a vegetable-producing area is irrigated land in southwest Kansas. As long as the mining of groundwater is allowed, irrigators will pump it up as long as it is profitable. Even where the aquifer is not being depleted, the cost of pumping water is changing the economics of crop production. Vegetables are more profitable than grain crops under irrigation. They require some special attention, but cultural practices are not a barrier to their production in southwest Kansas. Organizational and distributional barriers do exist, and for southwest Kansas to be able to enter a larger market, joint investment and coordinated marketing efforts would be required.[93]

Rather than relying on specialized production by large growers to meet our needs, de-centralized vegetable production that surrounds population centers should be encouraged. This would stimulate the local economy, employ more people and provide a local source for a variety of farm-fresh foods. One of the largest vegetable growers in the Midwest farms 3,000 acres of vegetable crops (primarily sweet potatoes, potatoes, and sweet corn) in the Kansas City area and ships then all across the Midwest. If this same acreage was divided into smaller parcels to surround the Kansas side of metropolitan Kansas City, it could supply a substantial portion of the city's in-season vegetable needs. In total, only 38,250 acres of vegetables are required to meet the consumption of fresh and processed vegetables by Kansas citizens.[94]

De-centralized production is already occurring. There are 178 roadside markets, and fourteen Kansas communities have farmers markets which sell locally-grown fruits, vegetables, and honey.[95] Also, home garden production in Kansas was worth $60 million in 1980.[96] Forty-seven percent of all households in the U.S. had gardens in 1981 and the number is climbing because people are motivated by higher food prices to offset inflation.[97] The percentage of home gardens in Kansas is probably even higher because of our more rural character and available land for gardens.

FRUIT PRODUCTION

There is a long history of fruit growing in Kansas, going back to the Native American's use of wild fruits and Coronado's observation in 1541 that "we find prunes like those in Spain, some of which were black; also some excellent grapes and mulberries."[98] As the prairies of Kansas had few trees, the pioneers planted trees, including many fruit trees.
Fruit culture reached its peak of importance around the turn of the century and has been in decline ever since.

Apples

Apples have remained the most important fruit produced in Kansas, but only at a fraction of their previous importance. Kansas produced 3,714,000 bushels of apples in 1890. By 1980 this had decreased to 577,500 bushels. In 1897, Kansas had 11,187,332 apple trees (more than 7 trees per person) covering 2,035,000 acres. In 1980 there were only 1,800 acres of commercially grown apples[99] (see figure Q).

Figure Q

FRUIT, 1916-1980

Year	Commercial Apples			Peaches			Grapes		
	Bearing acres	Production, million pounds	Farm value (thousands)	Bearing acres	Production, million pounds	Farm value (thousands)	Bearing acres	Production, tons	Farm value (thousands)
1916	....	....	....	....	3.2	$122	....	....	....
1917	....	....	....	....	3.2	165	....	....	....
1918	....	....	....	....	2.4	188	....	....	....
1919	....	34.4	....	11,300	10.3	378	2,300	2,700	....
1920	....	34.8	....	10,800	7.8	551	2,600	1,800	....
1921	....	4.4	....	10,300	5	45	2,800	1,400	....
1922	....	71.3	....	9,900	35.9	1,010	3,000	3,300	....
1923	....	32.2	....	9,300	4.0	214	3,200	2,700	....
1924	....	52.2	....	9,000	9.6	410	3,400	3,000	$270
1925	....	39.2	....	8,600	13.7	572	3,600	2,500	212
1926	....	43.5	....	8,200	10.0	355	3,700	4,000	340
1927	....	58.6	....	7,800	9.4	343	3,800	4,200	315
1928	....	23.5	....	7,400	2.7	108	3,900	4,200	336
1929	...	37.6	$1,962	7,100	12.3	397	4,000	4,600	322
1930	...	17.2	998	7,500	1.3	40	4,000	3,500	282
1931	...	37.4	792	6,900	14.6	274	3,900	4,900	245
1932	...	15.2	1,624	6,900	2.2	55	3,800	4,900	196
1933		39.2	530	6,800	.7	23	3,600	4,200	189
1934	16,400	25.4	708	6,600	5.3	121	3,600	2,700	135
1935	16,400	49.2	1,018	5,800	10.1	252	3,400	4,000	180
1936	15,000	9.1	294	5,500	8	28	3,000	1,000	50
1937	13,300	51.2	1,001	3,700	8.2	214	2,200	2,600	143
1938	12,900	23.3	509	3,100	1.4	38	2,000	2,200	121
1939	11,400	48.8	917	3,300	5.8	139	1,900	2,900	118
1940	11,100	58.6	1,238	3,100	6.7	154	1,700	3,100	130
1941	9,100	17.7	467	2,300	1.2	30	1,600	2,100	105
1942	6,900	27.5	950	1,100	1.1	43	1,600	2,900	160
1943	6,300	12.1	534	1,500	.1	8	1,600	1,700	162
1944	6,200	15.1	996	2,100	.7	49	1,600	2,100	210
1945	5,700	14.1	998	3,200	3.9	227	1,600	2,300	175
1946	5,400	22.4	1,465	4,200	7.4	370	1,300	1,400	129
1947	5,100	29.0	1,382	4,500	6	34	1,100	1,400	123
1948	4,600	12.4	641	4,400	7.7	360	1,000	1,700	129
1949	4,100	23.2	836	4,500	8.9	324	1,000	1,600	128
1950	3,600	8.9	502	4,600	5.6	287	900	1,400	120
1951	3,500	18.8	834	4,400	6.2	312	800	1,300	112
1952	3,400	9.0	662	3,900	6.3	304	600	800	78
1953	3,000	7.6	522	3,000	3.8	200	500	600	60
1954	2,800	9.0	546	3,000	6.2	250	400	500	60
1955	2,600	10.0	518	1,900	5.2	265	300	500	60
1956	2,300	2.3	140	1,800	2.3	110	300	100	12
1957	2,200	12.8	500	1,600	7.4	333	300	600	60
1958	2,000	7.8	378	1,600	6.5	324	300	500	60
1959	1,900	10.0	446	1,500	4.8	259	300	400	60
1960	1,800	9.2	481	1,600	7.9	467	300	400	60
1961	1,700	10.5	492	1,800	6.5	367		Grapes discontinued.	
1962	1,700	9.1	459	2,000	4.6	308			
1963	1,600	9.1	450	2,000	2.4	171			
1964	1,600	14.3	687	2,100	8.4	475			
1965	1,600	13.0	308	2,000	7.2	407			
1966	1,700	9.3	322	2,000	1.0	79			
1967	1,700	7.5	432	2,000	3.6	324			
1968	1,700	17.0	911	1,900	6.2	527			
1969	1,500	17.6	915	1,900	9.5	703			
1970	1,900	13.0	536	2,000	8.0	608			
1971	1,700	15.5	966	2,000	6.0	528			
1972	1,900	12.4	658	1,800	1.7	153			
1973	1,900	15.0	1,110	2,000	10.0	1,120			
1974	1,900	14.3	1,372	2,000	2.5	325			
1975	1,900	17.0	1,444	2,000	11.0	1,485			
1976	1,900	11.4	901	2,000	4.0	660			
1977	1,900	16.0	1,409	1,200	9.0	1,350			
1978	1,800	10.0	1,110	1,100	5.0	880			
1979	1,900	13.0	1,340	1,100	5.0	1,250			
1980	1,900	11.0	989	1,100	6.5	1,300			

Source: 64th Annual Report and Farm Facts 1980 (Topeka: Kansas State Board of Agriculture, 1980)

In 1900, 90 percent of all apple seedlings used in the U.S. were believed grown on 800 acres of Kaw bottom land near Topeka.[100] In 1903 Frederick Wellhouse was considered the Apple King of the World, having 1,637 acres of apple orchards in northeast Kansas--the largest number of acres under one management in the world.[101] These examples show the former importance of apples in Kansas. Kansas can be a major apple-growing region, and centralization and specialization of crop production are not new to Kansas agriculture, although this trend has recently intensified.

Kansas currently has a significant production of apples, cantaloupe, peaches, and watermelon. We have the potential to grow all our needs for these fruit crops and also for cherries, grapes, nectarines, apricots, pears, plums, and strawberries. In 1980, there were 3,260 acres of fruit crops. To meet our consumption of the above crops, 8,063 acres would be needed.[102]

There has been an interesting trend in the consumption of fruits and vegetables in recent decades. Per capita consumption of leafy, green vegetables (lettuce, spinach, and celery) has increased, while there has been a decrease in the consumption of starch root crops (potatoes, sweet potatoes, and turnips). There has also been an increase in the consumption of citrus fruits, while the traditionally popular apple has declined.[103]

This has occurred mainly because the leafy, green vegetables and citrus fruits have become available to us all year around, due to inexpensive energy for transportation. This has allowed their production to be centralized in places like southern California and then shipped to Kansas. The traditional winter root crops and apples have lost their popularity. How many people today would say that they like turnips or parsnips, or would prefer a winter apple instead of an orange?

Kansans can become more self-reliant in fruit and vegetable production. Consumers need to support local growers whenever possible. Our diets need to be more attuned to the season when a Kansas farmer can harvest his perishable crops. Locally-grown produce can add to our margin of health because of its added freshness and nutritional quality. Tomatoes, sweet corn, and peaches will not come from Kansas fields and orchards in the middle of winter. Eating more cold hardy crops such as carrots, turnips, kale, and apples can extend the season of production for Kansas-grown vegetables and fruits. Local and home preservation of foods can stretch out Kansas food production throughout the year. Canning, freezing, drying, and the use of root cellars are important food preservation strategies.

Honey and Sugar

Bees are valuable as honey producers and even more valuable as crop pollinators. In 1980, over 2.1 million pounds of honey were produced worth $2.5 million retail value, providing 76.1 percent of our consumption of honey.[104] Yields per colony were about 50 pounds.[105]

Bees pollinate the alfalfa, lespedeza, and red clover seed crops; apples, peaches, and melons. In 1979, it was calculated that this service had a total economic impact of $16.3 million to the state.[106]

The Kansas sugar beet industry has declined to 15,000 acres of irrigated land in northwest Kansas. Production was 400 million pounds of beets in 1980[107] which resulted in 49 million pounds of refined sugar.[108] Kansans consume 83.6 pounds of refined sugar per person[109] for a total consumption of 196,922,800 pounds, so we import 75 percent of our sugar.

CONSUMPTION OF FOOD IN KANSAS

Kansas residents consumed 3 billion pounds of food in 1980 worth $2.1 billion. It would require 2.1 million acres to meet this consumption.[110] Kansas is fortunate to have 49 million acres of cropland (over 20 acres per person) and 27.3 million acres of prime farmland.

Kansas produces much more food than Kansans consume, but most foods that Kansans eat are not grown or processed in Kansas. When a person walks into a grocery store or supermarket in Topeka or Garden City or elsewhere to buy food, the foods that are bought (with the exception of beef, pork, dairy and wheat flour products) probably do not come from Kansas.

Two reasons for the consumption of non-local foods are the national distribution system of foods and the production of foods in specialized areas. Just as Kansas has specialized in wheat and beef, California has specialized in fruits and vegetables. Specialized production has been possible partly due to the economies of scale--as production costs per unit of a commodity decline, more units can be produced--up to certain limits. However, it has been the relatively inexpensive sources of energy that have made mass production and distribution systems economical. Now, energy economics are making foods more expensive. Consumers can either cope with the present system or actively work to change it. The "Action Toward Sustainability" section of this study suggests many actions that we can take to redirect our food system.

What would Kansans do if we could not get our food from California or Florida or Mexico? The effects of a major strike in the trucking industry or a decreased oil supply would be devastating. About 500 truckloads of food come into Kansas each week to maintain our food supply.[111]

More likely than a total shutdown of the distribution system, would be a reduced supply and a drastic price spiral. A recent study by the U.S. Department of Energy disclosed that a 10 percent reduction in the oil supply would result in a 55 percent increase in the cost of raw commodities.[112] In May, 1981, the cost of transporting one truckload of fruits and vegetables was already over $1.11 per mile.[113] Aside from the vulnerability of the transportation system, we are also vulnerable to weather extremes in other areas (freezes, droughts, floods) and pest problems (infestation of a production-specialized area by a Mediterranean fruit fly type pest).

In 1980, Kansas imported $772 million worth of basic foodstuffs (41 percent of our food) into the state.[114] Although this is less than the amount of food exported, food imports represent a drain on the Kansas economy that each person pays for. Each Kansas citizen paid $328 in 1980 for basic foodstuffs that were imported into Kansas.

Food and food products that are produced within our state produce income that circulates and actually multiplies the initial value of the food. Income multipliers have been determined for many Kansas commodities. They vary from a low $1.67 for corn to $5.00 for cattle, and to $7.00 for grain mill products (see figure R). These figures would be even larger if we had a more decentralized food system since local production stimulates local industries. Kansas imports a lot of high value fruits and vegetables that have large income multipliers when processed and used within our state. Foods shipped into Kansas represent not only a drain on our economy, but the loss of potentially multiplying that value by employing more Kansas citizens.

Figure R

Income Multipliers: Ratio of Initial Income Effect To Total Income Effect

Sector	Multiplier
Corn	1.669853
Sorghum	1.708417
Wheat	1.798618
Other Grains	1.768416
Soybeans	1.729307
Hay	1.558831
Dairy Products	3.386584
Poultry and Poultry Products	1.803633
Cattle	5.001746
Hogs	3.291745
Other Agricultural Products	2.237196
Agricultural Services	1.862006
Meat Products	6.948381
Grain Mill Products	7.179258
Other Food & Kindred Products	3.083890
Farm Machinery	1.697356
Groceries	1.655767
Farm Products	2.200621
Eating and Drinking	1.878326

Source: The Inter-Industry Structure of the Kansas Economy, Kansas Department of Economic Development, Topeka, 1969, p. 153-155

The $772 million worth of food imported into our state, when multiplied by the farm products multiplier of 2.2 in figure R, results in $1.7 billion that could be added to the state's economy solely by growing our own food. This figure is probably quite conservative, and would be multiplied even further in cases where the food was processed or preserved for the off-season.

Buying foods from afar also affects their quality, taste, and our health. The best tasting, highest quality foods are those that have the shortest distance and time from the field to the table. These homegrown or local foods will retain their highest nutrition if stored, processed, and prepared properly. Non-local foods have to keep longer and are more likely to contain chemical preservatives to help them maintain "shelf-life". Many of these substances are suspected of causing a variety of deleterious side effects to human health, including cancer, and all of them are an added expense. Kansans should weigh the full costs of food imports, eat more local foods, and encourage more local production for the health of our economy and ourselves.

NEGATIVE IMPACTS OF CURRENT PRODUCTION PRACTICES

Kansas agriculture is extremely productive. However, current production practices have taken a significant, but not always directly observable toll on the environment and resources of Kansas. Kansas agriculture has made a significant impact on our soils and water, which affects the environment and animal life, including humans.

Soil Erosion

Kansans have long heard the cry of alarm about soil erosion and depletion. The First Biennial Report of the State Board of Agriculture stated in 1878 that we must "warn the farmers of Kansas against doing precisely what the settlers of the older States did in taking from the earth more than they returned to it, thereby robbing it of its elements of fertility."[115] The cry was heard again during the Dust Bowl of the 1930's. Now the cry is not so loud, although the problem is still serious. The abundant productivity of Kansas agriculture has given us a false sense of security.

Soil erosion is often a hidden process, occurring at rates slow to the eye, but rapid in geologic time. Earth-moving equipment is often used to hide the scars of water erosion. Nutrients that are carried away by wind and water are replaced by chemical fertilizers. Kansas loses 193 million tons of soil annually due to erosion by water and wind.[116] This is nine times greater than the 1980 weight of production of wheat, corn, grain sorghum, oats, barley, rye, soybeans, popcorn, and dry beans. It would take 4,825 trucks, loaded to their full capacity, to haul this amount of soil.[117] There is an acceptable rate of erosion of five tons per acre per year on cropland and pasture and two tons per acre on rangeland. With erosion up to these amounts, it is believed that "a high level of cropland and rangeland productivity can be obtained economically and indefinitely."[118] These figures are based upon the rates that soils form and the rate that soils leave the field. However, the Soil Conservation Service reports that 54 percent of Kansas cropland needs additional conservation treatment.[119] Sixteen million acres of land in Kansas are eroding at rates that are higher than the acceptable level and 6.8 million acres of cropland or 14 percent are losing more than 10 tons of soil per acre per year.[120]

Soil erosion varies from east to west across Kansas. Brown County, located in northeast Kansas, has thick, highly erosive loess soils and receives about 36 inches of rainfall per year. Its 260,000 acres of cropland lose on the average 6.66 tons per acre per year due to sheet and rill erosion, and 14,000 of those acres lose an average of 15.4 tons per acre per year.[121]

Grant County is located in southwest Kansas and receives about 18 inches of rainfall per year. Wind erosion is a more serious problem here, with the county's 300,000 acres of cropland losing an average of 6.61 tons per acre per year due to wind erosion and an additional 2.03 tons per acre per year due to sheet and rill erosion.[122]

Soil erosion is not just the loss of a physical substance--dirt; it is the destruction of an organic entity full of life. The value of nutrients, organic matter, tilth, soil fauna and flora lost due to soil erosion is quite large, yet difficult, if not impossible to calculate. The future of Kansas agriculture depends on the soil. Rich prairie soils are a valuable resource that should not be diminished or depleted, but managed, protected, and cherished.

Groundwater Depletion

The Ogallala formation of the High Plains Aquifer underlies a good portion of western Kansas, and is one of America's major aquifers. Starting in the 1940's in Grant County in southwest Kansas, this source of water, which is naturally less than 100 feet below the ground in most places, has been pumped up to irrigate Kansas crops.

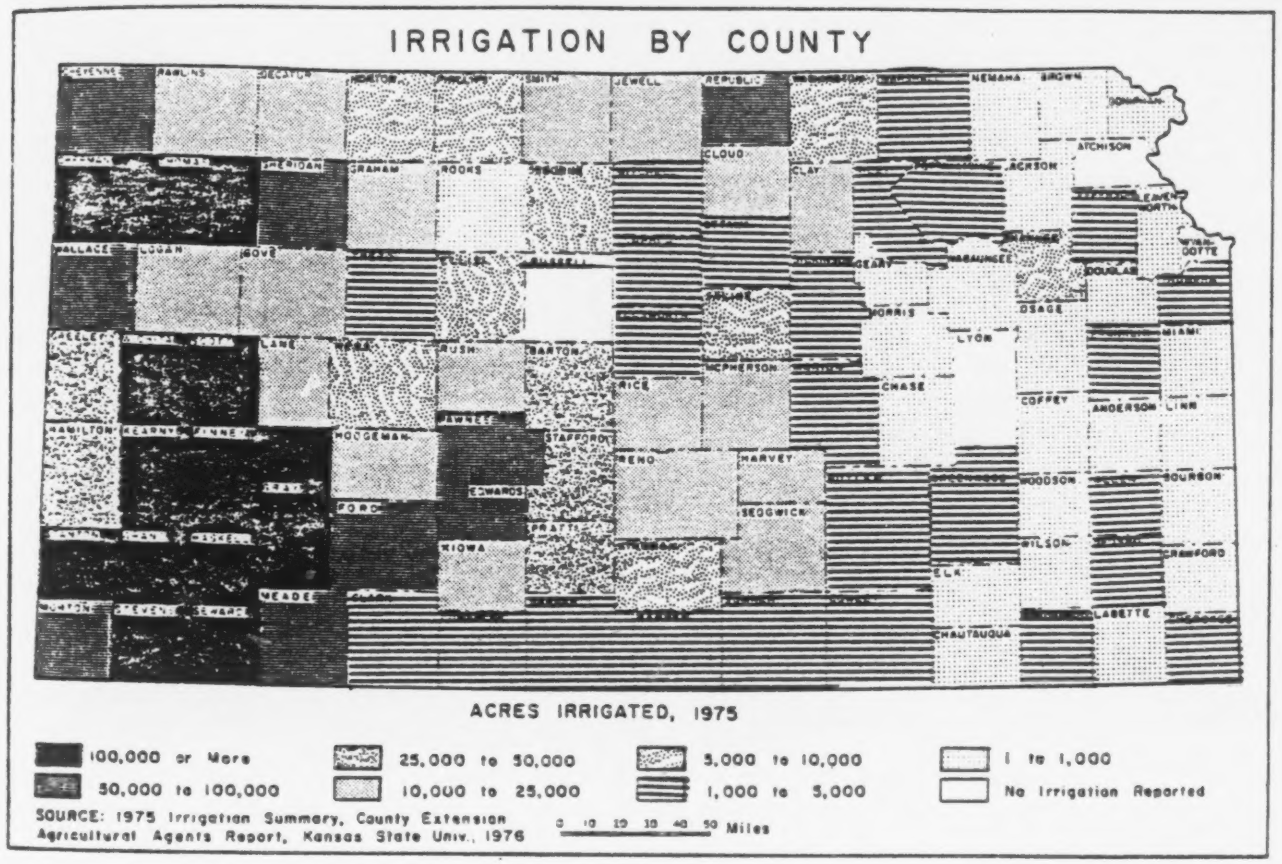
Irrigating crops has been very profitable for farmers and has dramatically changed the economics of western Kansas agriculture. The counties with the three highest personal farm incomes--Finney, Ford, and Haskell--are located in the most heavily irrigated portion of southwest Kansas and have farm incomes that were triple the state average.[123]

Irrigation has intensified in recent years in western Kansas, especially with the use of center-pivot irrigation systems. By 1977 the number of irrigated acres peaked at 2.2 million[124] (see figure S for 1975 data and Figure F for 1979 data). Irrigation is the main use of groundwater within the state and increased from 68 percent of total withdrawals in the state in 1965 to 80 percent by 1975 (see figure T).[125]

In eastern and central Kansas, natural recharge by rainfall is currently adequate in maintaining the saturated thickness of the aquifer. However, in western Kansas natural recharge is less than one-half inch per year, making the aquifer essentially a nonrenewable resource. The saturated thickness of the aquifer continues to decline.[126] For the year preceding February, 1981, the water-level (saturated thickness) dropped on the average about one and one-half feet in western and south-central Kansas and for 1982 declined another one-half foot (following a year of above average rainfall).[127]

One hundred and eighty million acre feet of the High Plains Aquifer had been dewatered in Kansas by 1980. This accounts for 8 percent of the pre-development level, but some areas have been depleted by over 25 percent and several areas are over 50 percent depleted[128] (see figure U). In 1977, the average saturated thickness varied from 244 feet in southwest Kansas to 96 feet in northwest Kansas to 53 feet in west-central Kansas.[129] Six of 13 counties in southwest Kansas have

Figure S


IRRIGATION BY COUNTY
CHEYENNE
RAWLINS
DECATUR
NORTON
PHILLIPS
SMITH
JEWELL
REPUBLIC
NEMAHA
BROWN
ATCHISON
CLOUD
CLAY
JACKSON
SHERIDAN
GRAHAM
ROOKS
WALLACE
LOGAN
GOVE
ELLIS
GEARY
WABAUNSEE
DOUGLAS
MORRIS
LYON
OSAGE
MIAMI
LANE
RUSH
BARTON
RICE
McPHERSON
CHASE
COFFEY
ANDERSON
LINN
HAMILTON
KEARNY
FINNEY
HODGEMAN
PAWNEE
STAFFORD
RENO
HARVEY
GRAY
EDWARDS
FORD
KIOWA
PRATT
SEDGWICK
WOODSON
BOURBON
WILSON
CRAWFORD
ELK
MEADE
MORTON
STEVENS
SEWARD
CHAUTAUQUA
LABETTE
ACRES IRRIGATED, 1975
100,000 or More
50,000 to 100,000
25,000 to 50,000
10,000 to 25,000
5,000 to 10,000
1,000 to 5,000
1 to 1,000
No Irrigation Reported
0 10 20 30 40 50 Miles

SOURCE: 1975 Irrigation Summary, County Extension Agricultural Agents Report, Kansas State Univ., 1976

Figure T

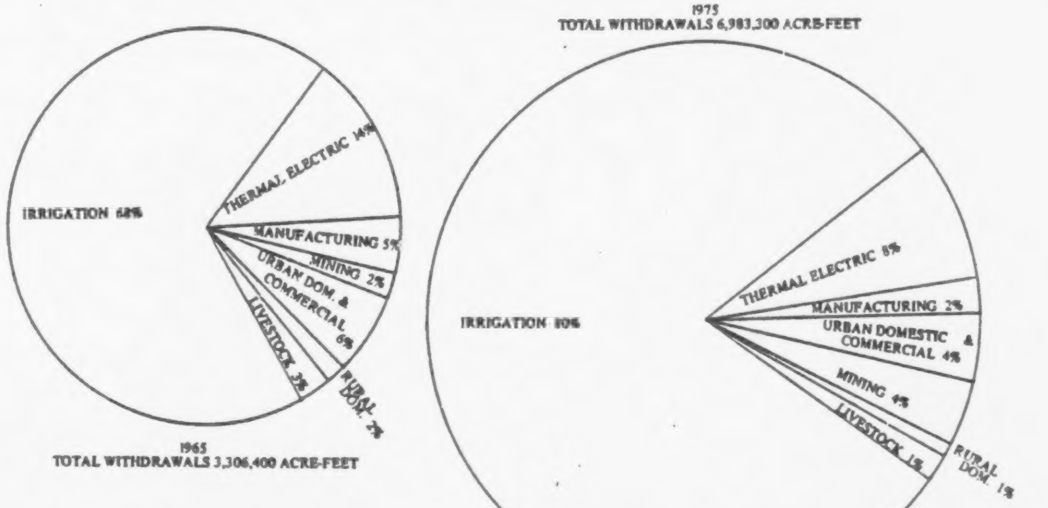
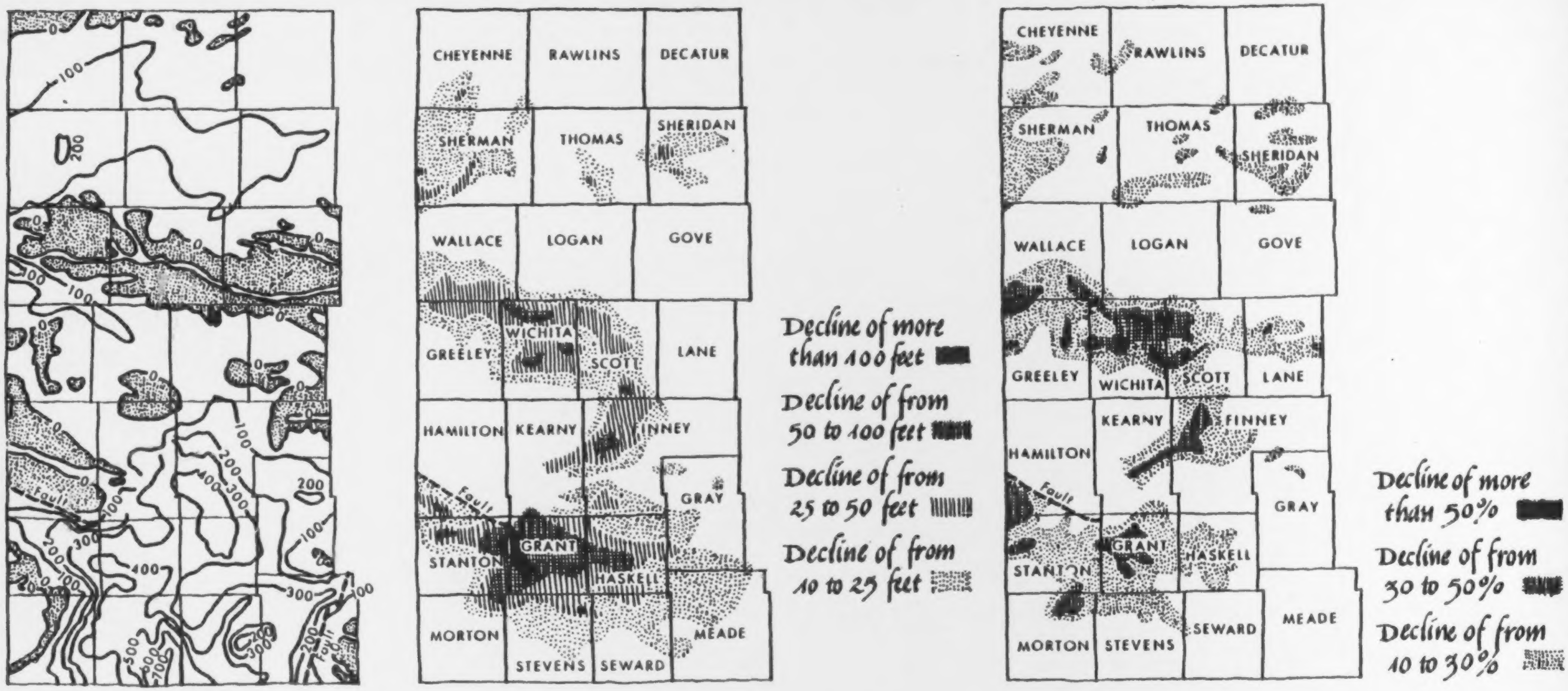


FIGURE 14 DISTRIBUTION OF WATER WITHDRAWALS 1965-1975
KWRB MAY 1978

Source: Socio-economic, Land Use, and Water Use Information and Projections (Topeka: Kansas Water Resources Board, 1979).

Figure U


0
100
200
300
400
500
Fault
CHEYENNE
RAWLINS
DECATUR
SHERMAN
THOMAS
SHERIDAN
WALLACE
LOGAN
GOVE
GREELEY
WICHITA
SCOTT
LANE
HAMILTON
KEARNY
FINNEY
GRAY
STANTON
GRANT
HASKELL
MORTON
STEVENS
SEWARD
MEADE
Decline of more than 100 feet
Decline of from 50 to 100 feet
Decline of from 25 to 50 feet
Decline of from 10 to 25 feet
Decline of more than 50%
Decline of from 30 to 50%
Decline of from 10 to 30%

Estimated Saturated Thickness 1965

Estimated Water Level Declines 1950-1975

Percent Change in Water Level Since 1950

REGION*	1975 Acres		1975 Estimated Groundwater Supply	Average Annual Precipitation	Evapo-transpiration and Runoff	Recharge	1975 Estimated Groundwater Withdrawn
	Irrigated	Total	million	acre	feet	(ac. ft.)	(ac.ft.)
West Central	411,000	2.4 million	10	3.70	3.66	40,000	589,000
Southwest	1.6 million	6.9 million	223	10.71	10.55	165,000	2.9 million
Northwest	434,000	5.8 million	63	9.33	9.21	111,000	763,000

* These regions include the counties wholly or partially in the corresponding groundwater management district.

Source: Task Force on Water Issues, State of Kansas, Governor's Office, 1977.

had more than 30 percent of their saturated thickness depleted by 1978.[130] (Figures V and W illustrate this trend.)

In western Kansas, irrigation is the planned mining of groundwater in the Ogallala aquifer. There are three ground water management districts for western Kansas. Local people on their boards have made the decision that the beneficial effects of mining the aquifer outweigh the detrimental effects of depleting this resource. The Southwestern Kansas Management Plan stipulates a maximum depletion rate of 40 percent in 25 years.[131] In effect, the decision has been made to allow the current generation to exploit this resource. This policy is encouraged further by the Internal Revenue Service which allows irrigating landowners to take a tax deduction for depreciated land value as a result of groundwater loss.

The Ogallala Aquifer is in no danger of being pumped dry, but it is becoming prohibitively expensive to reach. As the saturated thickness declines, greater numbers of deeper wells are required to irrigate crops, and it soon becomes an uneconomical proposition for crop production. This is already occurring in some areas. Since 1977, total irrigated acres have declined in western Kansas.[132] There has also been a shift from water-thirsty corn to wheat and grain sorghum which only need to be partially irrigated to produce good yields. By 1980, irrigated acres of corn, wheat, and grain sorghum in western Kansas were nearly equal. The shift is directly attributable to increased water pumping costs and to water becoming a limited resource in some areas.[133]

A recent report by an economist of the High Plains Water Study predicts that if future market forces are allowed to affect the costs of production and if currently available and proven technology and

Figure V

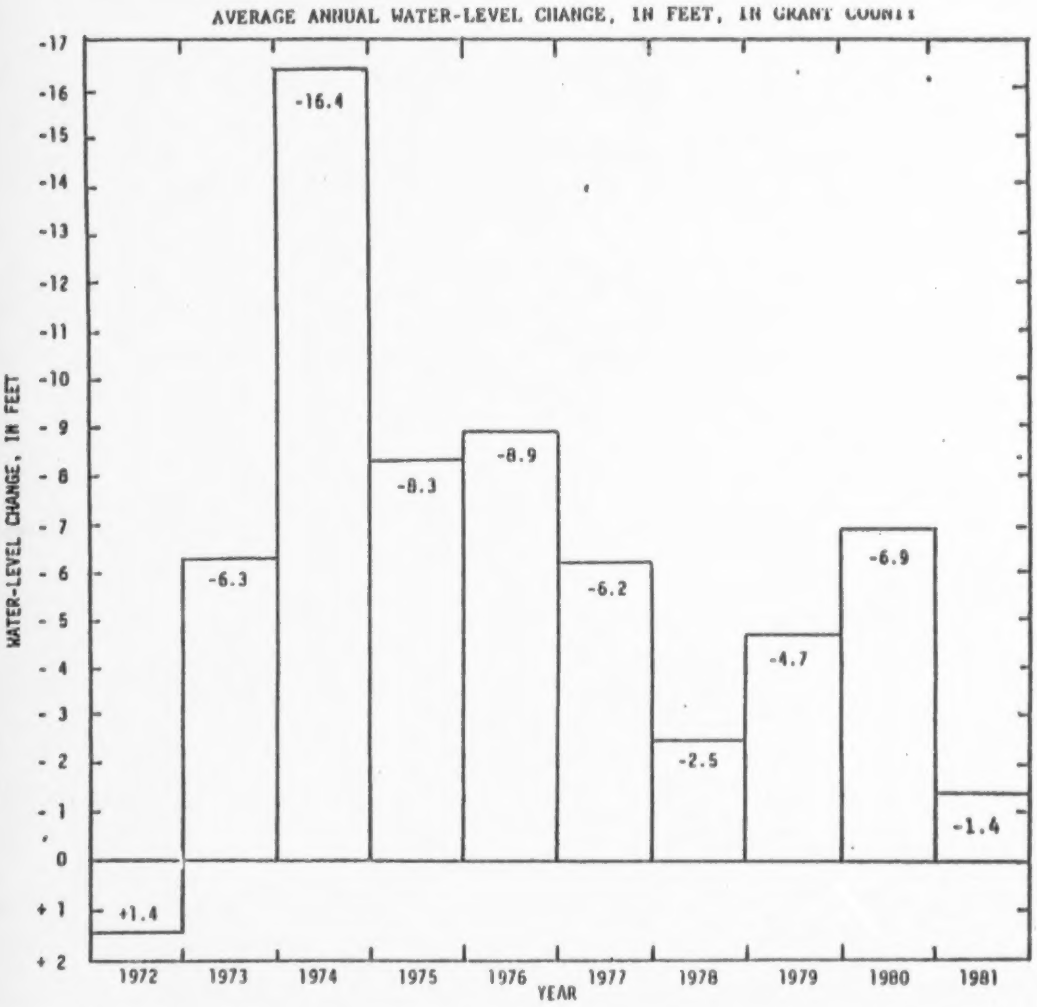
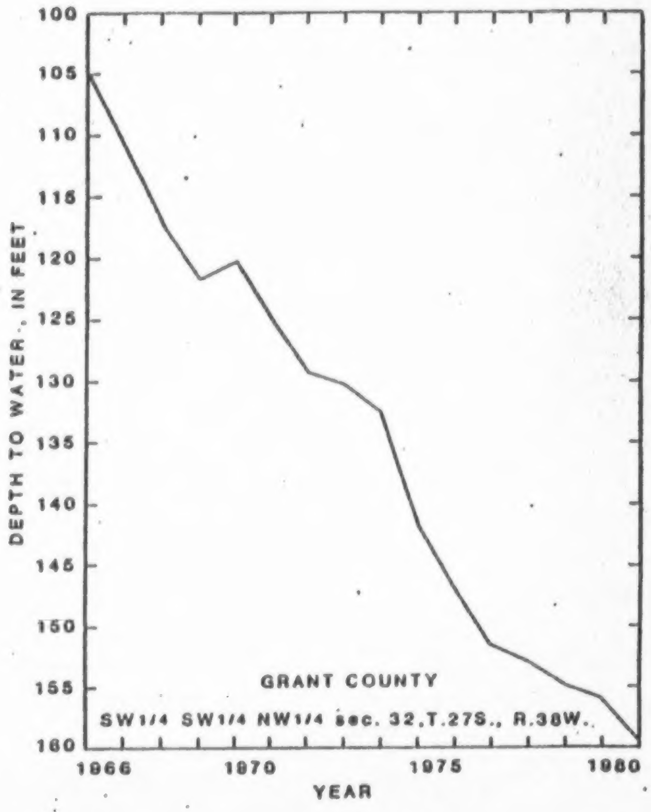


Figure W



Hydrograph for observation well in the SW¼SW¼NW¼ sec. 32, T.27 S., R.38 W., Grant County. Saturated thickness January 1981, 211 feet. Percentage decline in saturated thickness 1966-81, 21 percent.

Source: Howard O'Connor, Kansas Geologic Survey, information from 1981 and 1982 press releases, water levels in Western and South-Central Kansas.

irrigation practices are adopted, then irrigated acreages are estimated to decline 19 percent (0.4 million acres) by 1985; 52 percent (1.1 million acres) by 1990; 57 percent (1.2 million acres) by 2000; and 75 percent (1.6 million acres) by 2020.[134]

A Kansas State Water Plan study states that "the most probable future socio-economic setting in the High Plains area (of Kansas) is a severely constrained irrigated agriculture sector. The majority of irrigated agriculture development would revert to dryland agriculture."[135] (Figure X illustrates the projected water requirements of this area.) This drop in irrigation acreage will have a significant impact on the economy of western Kansas.

There are two proposed technological solutions to abate groundwater depletion--weather modification and inter-basin transfer of water. Western Kansas has been a testing ground for weather modification activities, but the seeding of clouds has yet to be proven economically feasible or entirely successful.[136] Also, the environmental impact of increased weather modification activities has not been adequately calculated.

The movement of water from one water basin to another is also suggested as a solution to western Kansas water problems. It is an uphill proposition (see figure Y) as the areas of the state with supposed excess water are about 2,000 feet lower than the cropland that sits above the Ogallala Aquifer. The energy costs, environmental impacts (due to canals, loss of water from the source, and the construction of power plants needed to pump the water uphill), and political barriers make this proposition of questionable economic feasibility.[137]

Figure X

PROJECTED WATER REQUIREMENTS
HIGH PLAINS AREA

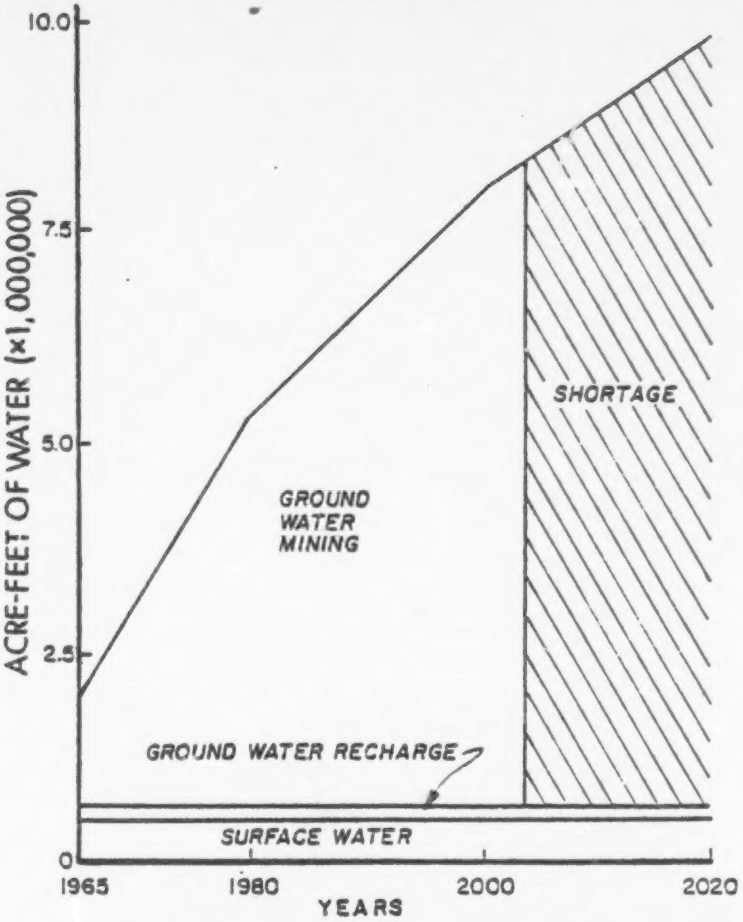
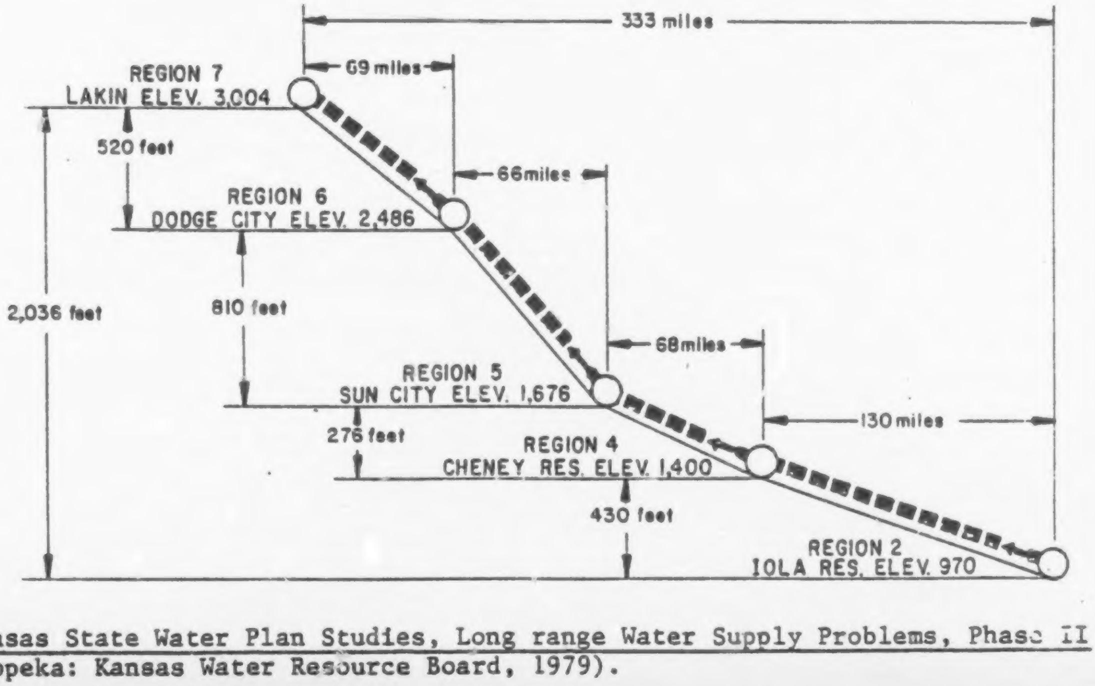


Figure Y

KANSAS STATE WATER PLAN STUDIES, PHASE II
WATER TRANSFER SCHEMATIC FROM ECONOMIC
REGIONS 2, 4 AND 5 TO ECONOMIC REGIONS 6 AND 7


333 miles
69 miles
66 miles
68 miles
130 miles
REGION 7
LAKIN ELEV. 3,004
520 feet
REGION 6
DODGE CITY ELEV. 2,486
2,036 feet
810 feet
REGION 5
SUN CITY ELEV. 1,676
276 feet
REGION 4
CHENEY RES. ELEV. 1,400
430 feet
REGION 2
IOLA RES. ELEV. 970

Source: Kansas State Water Plan Studies, Long range Water Supply Problems, Phase II (Topeka: Kansas Water Resource Board, 1979).

Water Quality

Kansas agriculture impacts the quality of groundwater and surface water. As the Ogallala Aquifer is being depleted, ground water quality is becoming a more serious problem. When large quantities of water are pumped out of an aquifer, other water moves in. In some locations of southwest Kansas, adjacent low quality aquifers which have high salt contents move into the aquifer being depleted. This creates problems because salt concentrations in water inhibit plant growth.

Groundwater quality may also be lowered by pesticide and fertilizer contamination. The porous soils of western Kansas are quite susceptible to percolation of agricultural chemicals into the aquifer. Recirculation pits which catch excess irrigation water tend to increase the concentration of agricultural chemicals and the amount that may enter the aquifer. Pesticides do not seem to be a problem yet, but nitrates (from fertilizer) are creating some problems. Of the 274 wells reported in Water Resources Data for Kansas-Water Years, 1977, 30 wells (11 percent) exceeded the EPA drinking water quality standards for nitrates.[138] Two more direct ways that groundwater contamination occurs are through leaky well casings and agricultural chemicals flowing back into the aquifer through inactive irrigation systems.

Surface water quality degradation is caused by erosion from fields, dewatering of streams, feedlot runoff, and agricultural chemicals. According to the Kansas Agricultural Runoff Water Quality Management Plan developed in 1978, every stream in Kansas has too much sediment because of excessive erosion from Kansas cropland.[139] In 1965, western Kansas had 24 manmade lakes with a total of 4,915 surface acres. Due to silting and dewatering, 14 lakes with an original surface area of 4,212 acres had been abandoned (an 86 percent reduction) and fisheries management plans were discontinued by 1979.[140]

Due to diminishing tree cover, the Arkansas River west of Dodge City has lost 50 percent of its riverside habitat while natural sedimentation is inhibiting the fish populations and reducing associated aquatic habitat. This resulted from changes in land use and intensified utilization of surface and stream valley water supplies which have dewatered the river. Between 1972 and 1979 there has been a reduction of 83 percent in the number of miles of the upper Arkansas River in western Kansas that could be fished.[141] The Arkansas River has become an intermittent stream. It is dry enough that a center-pivot irrigation system has been erected across the former river bed in one locality.

Agri-chemical Contamination

Agricultural chemicals, particularly nitrogen fertilizers, have played a major part in increasing agricultural productivity within the state of Kansas. Total commercial fertilizer usage was 909,000 tons in 1979; of this figure, nitrogen use amounted to 640,000 tons; phosphorus 205,000 tons; and potash 64,000 tons.[142] In 1978 about 18.5 million pounds of pesticides were used on Kansas' top five agricultural crops--wheat, corn, grain sorghum, soybeans, and alfalfa. Herbicides were used on 7.1 million acres, insecticides on 4 million acres and fungicides on 3.4 million acres, with an additional 2.5 million acres of rangeland treated with herbicides.[143]

Agricultural chemicals used in such magnitude and over such a large area can create many health and environmental problems. Chemical fertilizers are often used as substitutes for the nutrients that are naturally released in the breakdown of plant and animal material within the soil. Since chemical fertilizers contain very little physical substance, they do not inhibit soil erosion as natural sources do. Chemical fertilizers are also highly soluble and leach from soils to become pollutants. Besides groundwater problems, nitrate levels are increasing in the major streams of Kansas, but are still well below EPA standards for drinking water. Phosphorus exceeds the EPA standards in all major Kansas streams, but fortunately because of low nitrate and oxygen levels, it is in no immediate danger of causing algal bloom in Kansas streams.[144]

Pesticides are an even more serious health hazard. Pesticides that were considered "safe" several decades ago and hailed as a modern miracle are now banned because of their health risks to the environment and humans. DDT and other chlorinated hydrocarbons are being replaced in Kansas by carbamates and organophosphates despite their toxicity and the higher occupational risks involved.[145] Even pesticides that are considered safe if used according to directions will not always be used in that manner and accidental and intentional exposure will occur.

The health of fish in Kansas waters is an indicator of the quality of the environment we live in. In 1981, there were 59 fish kills reported in Kansas and a documented 190,779 fish killed. It is estimated that there were a total of 250,000 reported and unreported fish killed in 1981. Agricultural operations (pesticides, fertilizers, and feedlot runoff) were responsible for 112,000 fish reported killed in 1981 (59 percent of all causes). Feedlots were responsible for the death of 85,000 fish and pesticides for 25,000 fish.[146]

In 1976 when there were problems with the misuse of endrin being aerial-sprayed to control cutworms in south-central Kansas wheat, there were 27 fish kills (65 percent caused by agricultural operations) of which 14 were caused by pesticides. Of the total 141,700 fish that were reported killed that year, 82,700 were killed by pesticides and a significant number of those by endrin. Endrin is now a restricted pesticide, but is still allowed on apples and wheat.[147]

Atrazine accounted for 24 percent of all herbicides used in Kansas in 1978.[148] In a recent University of Kansas study, atrazine introduced into self-contained ponds at rates sometimes found in Kansas waters, was shown to reduce phytoplankton photosynthesis and reduce fish reproduction. Even though at the end of the experiment numbers and size of adult female fish in both the control ponds and atrazine-added ponds were equal, the researchers concluded that atrazine was responsible for the adverse affects and that pollution perturbations, such as herbicides in Kansas waters, can only be revealed by a whole system experiment.[149] Such experiments are rarely used to determine the effects of pollutants.

Agricultural operations that produce fish kills in our streams are a serious threat to our health because these waters often are the drinking source for many of us. The Kansas Department of Health and Environment recognizes this threat and issues Pesticide Alert Bulletins to health administrators. The one for April 16, 1981 stated:

> The Board of Agriculture predicts that insect infestations on crop fields are going to be very high this year. They also expect a tremendous increase in the use of pesticides for the control of these bugs.
>
> Based upon this prediction, we expect an increase in the number of poisoned persons as a result of exposure to these potentially hazardous pesticides.[150]

While this bulletin will help to react to the problem created by agricultural chemicals, it does not deal with the basic use of these substances or solve the problems that they create to the health of people and the environment. A review and analysis that looks at all aspects of the use of agricultural chemicals in the state of Kansas is needed.

THE FARMER: AN ENDANGERED SPECIES?

Economics

The Kansas farmer is economically caught between a rock and a hard place--not a very good place to try to farm. Production has increased dramatically through better technology and farming practices and this is considered the success story of agriculture. But at the same time the countryside has been depopulated, reducing the number of farms and farmers. There were 166,000 farms in Kansas in 1930. This declined to 135,000 in 1950, to 86,000 in 1970, and to 72,000 in 1980. At the same time, average farm size increased from 283 acres in 1930 to 664 acres in 1980, a 236 percent increase.[151]

The net farm income for 1981 totaled $605 million. This was the second of two large consecutive yearly declines and was due to adverse weather, lower prices and high interest rates. Although the net farm proprietor's income in 1981 was only 2 percent of the total state personal income, Kansas farmers spent about $6 billion in production expenses and personal consumption expenditures, a significant portion of the state's economy.[152]

Some of the best farmland in the state is being lost to development. Kansas loses over 36,000 acres of prime farmland per year due to urban sprawl and other non-farm uses. This is more than fifty-six square miles and is about equal to the total acreage of land needed to grow all the climatically adapted fruits and vegetables Kansans consume.[153] Most towns and cities in Kansas are located in river valleys which are prime farmland, and most of them have industrial parks or are building houses or businesses on them. There needs to be some means of protection that would steer towns and cities away from developing lands with the highest agricultural productivity. As one retiring Finney County farmer said after selling 160 acres to the developer of an industrial park: "You get to the point where you can't afford to own it for farming."[154]

Corporate Farming

In 1979 there were 1,864 corporations who reported, as required by law, they owned farmland in Kansas. These corporations owned 5.63 percent of the agricultural land in Kansas--more than double the 1975 figure, when 1,037 corporations owned 2.5 percent of the land. Of the corporations that filed, 87.4 percent were domestic for profit corporations which can loosely be defined as family farm corporations.[155] Family farms incorporate for tax advantages and ease of estate transferal. However, the same incentives which encourage family farmers to incorporate also attract non-farm and absentee corporations, often giving them increased benefits. Very little research has been done on the extent of non-farm and absentee corporate involvement in Kansas agriculture.

The Kansas Corporate Farming Law passed in 1931 was the oldest in the nation, but it was poorly enforced. A new Corporate Farming Law was passed in 1981 which defined family farm corporations, authorized farm corporations, and trusts and added some tough penalties for violators, including a $50,000 fine. However, "authorized farm corporations" can now have up to five shareholders and unlimited amounts of land. Also, there are loopholes that allow feedlots to own an unspecified amount of land needed to run their feedlots and that allow any corporation to own farmland for a "non-farming business."[156] With the loophole in the new corporate farming law, feedlots can own a considerable amount of land for their operations since it takes a lot of feed to fatten all the cattle on a 50,000 head capacity feedlot.

Corporations and individuals from outside of the U.S. owned over 64,000 acres of Kansas' farmland (worth more than $30 million) as of December 31, 1981. The Flint Hills, primarily used for grazing, have the highest foreign investment with 12,000 acres in Greenwood County and 11,000 acres in Butler County owned and controlled by foreigners. Also in southwest Kansas, 4,000 acres were owned by foreigners in Kearny County and 3,000 acres in Stevens County.[157]

Corporate agriculture controls more than just farmland in Kansas. Perhaps the most valuable land in the state are the feedlots of western Kansas. Almost all feedlots are incorporated. They are commercial feedlots, not family farm feedlots, because most of them are not part of a farm operation.

The two largest feedlots in Kansas are Caprock #3 at Leoti and Grant County Feeders Continental Grain Company at Ulysses. They are owned by Cargill and Continental Grain, which are multi-national corporations, and have maximum capacities of 75,000 and 55,000 head respectively. Neither of these two feedlots reported to the Secretary of State's corporation file with the name that they are licensed under at the State Animal Health Department and neither are listed under their parent corporation. Of the 55 largest feedlots in Kansas with a total maximum capacity of 1.2 million head, twelve did not report to the Secretary of State's file. However, it is possible that some may be listed under another name or are not corporations. The fattening of beef cattle in feedlots is the apex of Kansas agriculture in terms of potential profit. Careful monitoring and analysis of this industry is needed.

The Corporate Farming Law has several weak points. First of all, because the reporting act is vague, it is not clear according to records whether a corporation is a family farm corporation or some other type. It should be made clear exactly who owns and operates Kansas farms and feedlots. Secondly, there are no longer any acreage limitations for corporations. This is true for absentee corporations as well. It is also assumed that all family farm corporations are the same regardless of size. Thirdly, although the law has some stiff penalties for violations, there is no provision for adequate enforcement of the law.

Preserving and Rejuvenating the Family Farm

The family farm system of diversified agriculture found in Kansas has a heritage of hard work, dedication, conservation, responsibility, belief in community, and self-reliance. No other system of agriculture, including corporate agriculture, has offered so many advantages to Kansas or has been as productive. And yet we are in the midst of a transition to a corporate, industrialized agriculture that is removing itself from the family farm.

Corporations in and of themselves are not bad. Some family farms have incorporated. However, corporations tend to be very large entities and are usually incorporated for advantages such as tax breaks that are unavailable to small and medium sized operations. The future structure of Kansas agriculture is not clear. If Kansas is to be composed of family farms, then these farmers need to receive active and vocal support. Current tax laws and research may tend to favor the largest operations, those growing away from family farms. One Kansas State University professor stated that he realized he was training a majority of his students for corporate agriculture, but noted that opportunities are limited.

Laws and legislation are intended to create equal opportunities for all. Legislation is needed to bolster family farms in Kansas and check the power and control of the large farm operations--whether multinational or family farm corporations. Research should also support family farms and recognize that there are different scales and different economies for the larger family farms that grow grain and/or raise livestock and the smaller ones that grow speciality crops. They both need attention to help them maintain their viability.

Kansas agriculture and its supporting industries are the foundation of the economic base in Kansas. The 72,000 farms that are still left in Kansas, most of them family farms, plant the seeds for Kansas economic prosperity. It is time to preserve and rejuvenate family farm agriculture in Kansas. The Kansas Department of Economic Development, the Board of Agriculture, and Kansas State University have the resources and ability to promote an agriculture that will once again make the family farm a widespread economically viable production unit for managing the land resource of Kansas.

GOALS OF THE KANSAS FOOD SYSTEM [158]

ABUNDANCE: The food system should give every person access to adequate food--in quantity, quality and degree of choice.

DEPENDABILITY: The food system should provide every person with a reliable food supply--free from social, political, economic, or environmental disruption.

SUSTAINABILITY: The food system should be culturally, environmentally, and technologically sustainable in respect to production and all other aspects of the Kansas food system--including resource inputs, cultivation techniques, processing and distribution.

SAFETY: The food system should not endanger workers, consumers, or the environment.

EFFICIENCY: The food system should incur minimal energy or other resource costs and use biologically produced energy sources rather than fossil fuels when they are compatible with soil conservation practices.

APPROPRIATENESS: The food system should be matched to both the limits and needs of its region and locality.

EQUITABILITY: The food system's benefits should be available for use by all in a fair manner.

WEALTH: The food system should generate sufficient income to rural people to provide a standard of living equivalent to that of other sectors of the economy to maintain vigorous rural communities and to enable farmers to fulfill their land stewardship responsibilities.

FLEXIBILITY: The food system should be open to change, growth, evolution, creativity, and experimentation.

OPENNESS: The food system's organization, patterns of control and course towards the future should be within public view.

ACTIONS TOWARD SUSTAINABILITY

It needs to be recognized that consumers, farmers, legislators, agri-businesses, and researchers are concerned about the Kansas Food System and our environment. All of them are interested and will listen to concerned and informed citizens. Changes can occur when a number of vocal, intelligent, and concerned people take action to change current structures, systems, and practices and also work to create new ones. A list of recommendations follows, suggesting actions that we can take as consumers, farmers, and as citizens and legislators directing state governmental policy.

WHAT WE CAN DO--CONSUMERS

1. Buy Kansas-grown foods--support local growers whenever possible. The Marketing Division of the Kansas State Board of Agriculture is encouraging producers to use the identifying label and registered trademark (see figure Z) "from the land of KANSAS" so that consumers will know that a product is a Kansas product. Buy products that carry this label whenever possible.

2. Go to farmers markets--obtain a copy of "Farm Fresh, A Directory of Kansas Roadside Markets"[159] from your county extension agent for a location of the nearest community and roadside farmers market.

3. Determine food origins--ask your grocers where your food is grown and processed and suggest that they buy local foods. Tell them who is growing foods that they could carry locally. Make petitions requesting them to purchase local, high quality foods in season.

4. Change our diets--consume foods that are more attuned to our seasons, that could be grown in Kansas, and that support Kansas farmers. This would mean buying fresh strawberries, peaches, tomatoes, sweet corn, and other produce when it is in season and making sure that our wheat and bakery products, dairy products, and meat are from Kansas.

5. Become a producer--everyone can grow some of their own food in a garden or a greenhouse, or make a container garden or grow sprouts. Or if space allows, raise backyard animals like chickens or rabbits or fish in a backyard or greenhouse pool or tank. Every little bit helps and it makes us all aware how much time and energy are required to produce food.

6. Support local or regional-owned grocery stores--which will keep more of your money circulating locally. These stores can more easily buy local produce.

7. Join a food cooperative--where you join others and work together to buy your own food together in bulk orders and then divide them. There are presently at least 15 cooperative food buying clubs and storefronts within Kansas.

8. School lunch programs--can be changed by parents who express interest and concern in the diet their children have away from home. Schools can be encouraged and directed to buy local foods.

9. Get acquainted with local farmers--to understand their problems and their work, and to narrow the rural/urban social chasm.

10. Join discussion groups--on various topics of food production and consumption. Churches and other organizations have recently had world hunger and the family farm as topics.

11. Process and preserve more foods--when foods are in season. Excess from your garden or locally purchased produce can be preserved by canning, freezing, drying, or storing in a root cellar. These foods can be used later in the year and are more nutritious, better-tasting and less expensive than those bought at a store.

12. Educate yourself and your children--about the Kansas food system by taking adult education courses on various food and agriculture topics and by requesting that your children's teachers teach them about Kansas agriculture, where their food comes from, and about growing plants and gardening.

WHAT WE CAN DO--FARMERS

1. Consider alternative agricultural practices--such as farming organically or with minimum tillage, diversifying production, and experimenting with a high-value speciality crop.

2. Use alternative forms of energy--practice conservation and reduce energy usage wherever possible, consider a solar grain drier, solar hot water heaters for dairies, better insulation for farm buildings, water-pumping windmills, wind generators for electricity; plant windbreaks and woodlots, use crop wastes as an energy source consistent with soil and water conservation principles. Many farm organizations and Kansas State University have information available on alternative energy sources for the farm and some will also do workshops.

3. Reduce soil erosion--by working with the Soil Conservation Service, State Conservation Commission, and the State Association of Kansas Watersheds. Use farming practices that check soil erosion and build up the soil.

4. Develop on-the-farm fetilizer sources--as the price of nitrogen fertilizers goes up, it becomes more profitable to grow legumes on a wider scale as a supplemental or main source of fertilizer for crops. Promptly recycle animal wastes back to fields.

5. Explore direct marketing channels--sell directly to consumers where possible, or sell directly to local markets or packing plants, and form or join marketing cooperatives to pool commodities.

6. Identify products--as "from the land of KANSAS" with the Marketing Division of the State Board of Agriculture. This registered trademark is available upon written request from them. It is registered with the Secretary of State to ensure that it is used in the appropriate manner. This trademark can be an effective promotional and marketing tool. See Appendix 3 for their address.

7. Join farm organizations--be an organized force when seeking legislation, to create marketing channels, and to share and exchange information and skills.

8. Get to know consumers--educate them on exactly what a farmer does and why, explain the economic situation from your perspective and listen to the consumers problems (the farmer is a consumer too).

9. Request and support--information and research from our land grant college on improved fertilizer use, irrigation management, crop drying methods, alternative energy sources for the farm, local marketing strategies, and any other research that will support and promote family farms and sustainable production in Kansas.

WHAT WE CAN DO--AGRI-BUSINESS AND THE FOOD INDUSTRY

Agri-businesses and the food industry play an important role in the Kansas food system. They can help our food system become more sustainable by considering the following:

1. Request research and support it financially from our land grant college, the state agencies, and elsewhere that will lead us toward a more sustainable food system. This could include developing new products, machinery, and management practices that supplement biological processes and use our natural resources wisely.
2. Support Kansas and the local economy whenever possible to strengthen Kansas communities and to keep monies circulating locally.
3. Develop new products that support a sustainable agriculture and food industry. Examples are: more soil-conserving farm machinery, seeds that are adapted to energy and resource conservative agricultural practices, developing on-farm uses of wind and solar energy, and food products for the local market.
4. Get acquainted with farmers and consumers and solicit their ideas and opinions on ways to be more responsive to their needs and to make our food system more sustainable.

WHAT WE CAN DO--STATE GOVERNMENT

The State Government of Kansas and the Extension Service at Kansas State University can take a much more active role in promoting food self-reliance, a more regional food supply, and in developing a sustainable food system for Kansas. They can do this by providing information and guidance and through specific research and legislation.

The following recommendations will not only strengthen the Kansas food system, but they can also enhance the agricultural and state economies as well.

1. Institutional Food Purchasing

The state of Kansas should require our schools, hospitals, and other food-purchasing institutions to buy foods produced in Kansas when their quantity, quality, and availability are similar to imported foods. This would encourage and stimulate further production of fruits, vegetables, poultry, and fish within our state and would strengthen the connections between local producers and purchasers of meats, dairy products, eggs, and cereal products (including bakery goods). This would increase tax revenues and new jobs would be created. A study is needed to determine exactly how much more we can pay for local production when compared to imports and still improve the state's economy.

The State of Maine passed legislation in 1979 which required within-state purchasing by institutions for similar quality foods if their cost was not more than 3 percent higher than imported foods. It was estimated that by increasing the purchases of Maine-grown foods by in-state institutions by only 10 percent, Maine's gross state product would increase by $233,000, tax revenues would rise by $18,600 annually, and seventeen new $10,00 per year jobs would be added to the state's economy.[160]

Kansas currently imports a significant amount of food it consumes. The Kansas Department of Administration, Division of Purchases has no records of the origin of foods that Kansas institutions buy. They accept lowest bids regardless of origin. In the cases of beef, pork, dairy products, eggs and baked goods it is usually within the state, but other foods are more than likely imported into our state and are a drain on our state's economy. It is not feasible to require institutions to buy only local foods, but it is feasible, practical, and economically advantageous for Kansas institutions to buy Kansas-grown foods that are similar to food imports in terms of price, quality, and quantity, thus supporting Kansas producers. Legislation which gives direction to state institutions requiring them to buy local whenever feasible is needed.

2. Research and Extension--Our Land Grant College

Research and information on dissemination from our land grant college have helped the state to become a leading producer of agricultural commodities. They are also shaping the future of the food system in Kansas and need to be given encouragement and direction to make our food system more self-reliant and sustainable.

The purposes of our land grant college have recently been brought into question. Who are they serving? A conference was held at Kansas State University on this topic and an agricultural economist's reply was that "Land Grant programs in agriculture were designed to serve a decentralized agriculture and the surrounding communities toward which that kind of agriculture is reciprocally supportive".[161] The state of Kansas funded 43 percent of Kansas State University's Agricultural Experiment Station 1980 budget of $25 million. The state should exercise their fiscal and planning control to ensure that our land grant college does serve a decentralized and diversified agriculture in Kansas.

About 7 percent of Kansas State University's Agricultural Experiment Station budget is from private grants.[162] This percentage is small, but its impact is much larger because "a special interest group can fund a research project knowing full well that it will draw on university staff and facilities equivalent to five times the amount of funds it kicks in."[163] However, a recent study of the University of Nebraska Animal Science Department concluded:

> ...on the whole, research at Nebraska and elsewhere is still well settled in the arms of practical science, and serves well the interests of the commercial world. Private grants may not, as some have charged 'dictate' the research agenda. But private funding sources continue to find projects that accommodate their own research needs, while longer term research suffers.[164]

With this in mind, the State of Kansas needs to earmark state funds to support the long-term research needed to give Kansans a more sustainable food system. Specifically, they should mandate an in-depth study by Kansas State University on producing, marketing, and distributing various crops needed in our state to make our food system more self-reliant. They should also require investigation and demonstration of energy-saving and environmentally-sound technologies such as organic farming, on-farm energy production, biological fixation of nitrogen for fertilizer, biological insect control, crop rotations for weed control, local and direct marketing of agricultural products, perennial grains and other alternative crops, and agricultural practices that reduce soil erosion and restore soil health.

OTHER STATE LEGISLATION

The State of Kansas government has a unique opportunity to create progressive agricultural, food, and land policies. The federal government is reducing its activity in the food sector and is placing more of the burden of responsibility on the state. Consequently, the Kansas government must create its own progressive policies to meet the current and future needs of farmers and consumers. The following are actions that can be taken:

1. Preservation of Agricultural Land--Prime farmland should be preserved for future agricultural use through the use of agricultural zoning, formation of agriculture districts, public purchase of development rights, and/or penalties for converting prime farmland to other uses. Maryland has a law that could serve as a model.

2. Assistance for Beginning Farmers--establish a beginning farmer credit assistance program to insure that a new generation of young farmers replaces the older generation. This program should include: 1. loan guarantees or direct loans; 2. a partial interest subsidy; and 3. eligibility requirement ensuring that recipients are qualified to farm and have a net worth below a designated ceiling. Tax credits or financial incentives should be written into tax laws to encourage people to sell their land to beginning farmers. Minnesota has laws that could serve as models.

3. Establish a Kansas Water Use Commission--to monitor water use and depletion across the state, especially in western Kansas, and to make recommendations on the evolving regional water policy. Members of the five groundwater management districts, the Agricultural Board's Division of Water Resources, the Kansas Water Authority, the Kansas Geological Survey, and an environmental organization should comprise this board.

4. Pesticide Legislation--is needed to protect Kansas residents. The legislature should consider the following issues: 1. Recovery of damages

from pesticides should not be prohibited because of the failure to file a pesticide damage claim within 60 days of the discovery of pesticide damage; 2. All applicators should be trained and taught the associated hazards of pesticides to people, crops, animals, and the environment; 3. All pesticide businesses and their offices should be licensed; 4. Insurance should be made mandatory to cover pesticide damage; 5. Increase funding for the staff of the Weed and Pesticide Division of the Board of Agriculture to monitor accidents and misuse and to enforce the law; 6. Research should be undertaken that accurately weighs and quantifies the negative impact of pesticides on the Kansas environment.

5. Strengthening the State Conservation Commission--by increasing its funding to insure cost sharing money for soil and water conservation projects and to replace federal support of conservation programs as those funds are cut.

6. Corporate Reporting Law--should be strengthened to require corporations to file according to legal definitions to determine if they are family farm corporations, local corporations, or non-resident corporations. The law should be strengthened to limit non-resident corporations from becoming further involved in Kansas agriculture, and give absolute acreage limitations for all corporations.

7. Organic Certification Standards--should be enacted to enhance the ability of organic producers in Kansas to sell their products as organic products. Such a program would also protect consumers who want assurance that a product labeled organic is really organically-grown.

8. A Direct Marketing Program--should be established by the Board of Agriculture to promote the sale of Kansas-grown meat, dairy products, eggs, fruits, and vegetables directly to consumers. Existing city markets, shopping malls, large parking lots, stadiums, and fairgrounds can be turned into markets where Kansas farmers can sell their products. The Marketing Division of the Board of Agriculture should be given additional funding to further identify products, "from the land of KANSAS". West Virginia has a direct marketing program that could serve as a model for Kansas.

9. Crop Bounties--could be paid to Kansas farmers to encourage the production of new and speciality crops, especially fruits or vegetables. These bounties could be similar to those established by the state legislature in 1903 when they paid a two cent per pound bounty for all sugar beets produced within the state in order to establish the sugar beet industry in Kansas.

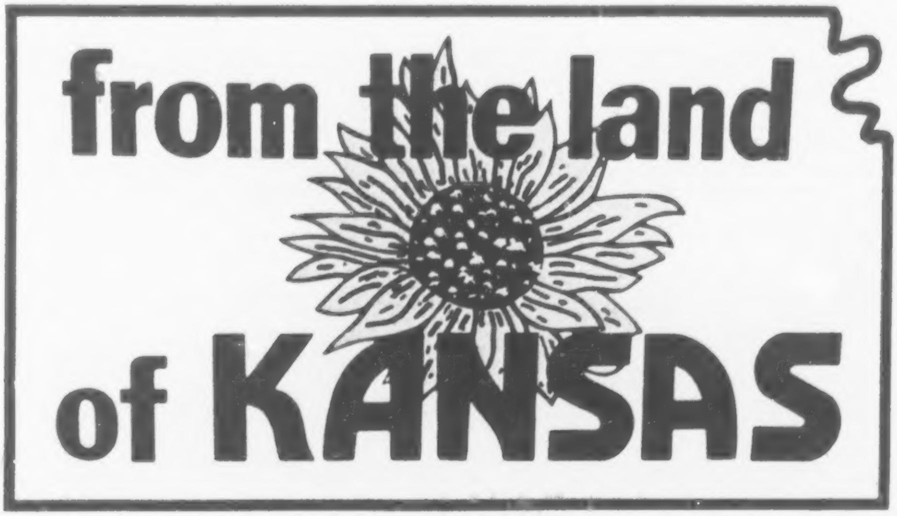
10. Severance Taxes--on excessive soil loss and water usage should be considered as a way to make sure our resources are available for future Kansans.

11. Develop an Emergency Food Plan--for the State of Kansas to be able to effectively respond to extreme crop failure, disruption of the transportation system, or disaster.

CONCLUSION

The Kansas food system is extremely productive and produces more food than Kansans can consume. However, it is not sustainable and does not always meet the food needs of Kansans. There are many creative and positive actions that we can take as consumers, producers, businesses, and as determiners of governmental policy to develop a sustainable Kansas food system. Appropriate use and control over our own agricultural and food resources are essential for the health of our economy, culture, and our own bodies. Everyday and into the future, food and agriculture are necessary to sustain us.

Figure Z



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APPENDIX 1

Kansas has an agricultural heritage to be proud of. Long considered the breadbasket of the United States, Kansas has produced not only important grain crops, but also apples, potatoes, sweet potatoes, cowpeas, peaches, canteloup, watermelon, sheep, chickens, and turkeys. Today, the production of five crops -- wheat, sorghum, corn, alfalfa, and soybeans -- accounts for 95 percent of the harvested value of all Kansas crops. Kansas ranks first in the United States for production of wheat, fourth for cattle and calves, eighth for hogs, and eleventh for corn grain.

Although agriculture is Kansas' biggest and most important business, there are problems facing future agricultural production. Sixteen million acres of land are eroding at rates higher than the "acceptable" rates of two to five tons per acre. Irrigation water withdrawals continue to exceed the aquifers' recharge rates, threatening not only the future availability of irrigation water, but also the quality of water in Kansas. The Kansas food system requires many changes to make it an abundant, safe, economical, sustainable source of food for all Kansans. These changes include more research in low input agriculture, more efficient use of water, more food processing facilities for Kansas-grown foods, and a statewide network of food producers, processors, retailers, and consumers.

Retail value of KS production	5,648,917,800
Retail value of KS exports	4,368,017,600
Value of production remaining	1,280,900,200

59% of consumption produced in KS

Kansas imports 41% of its food.

KANSAS FOOD IMPORTS

COMMODITY	PRODUCTION Production Retail Weight[a] (1,000 lbs)	Retail Value[b] ($1,000) (1980 dollars)	CONSUMPTION Consumption in Kansas[c] (1,000 lbs)	Retail Value[b] ($1,000) (1980 dollars)	% Import	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	Acres Cropland Used in KS Production	Acres required to produce 100% of Kansas Consumption[bb]
Meats										
Beef	1,595,312.0	3,509,686.0	180,198.5	396,436.7			88.7	3,113,249.4	3,932,963.0[d,z]	444,424.9[d,z]
Veal	59.0	200.0	3,533.3	11,977.9	98.3	11,777.9		NC	NC	NC
Lamb & Mutton	6,170.9	19,685.4	3,062.2	9,768.4			50.4	9,917.0	12,944.9[d,z]	6,420.7[d,z]
Pork	257,241.0	486,185.5	160,883.1	304,069.0			37.5	182,116.4	634,819.5[z]	461,686.9[z]
Grains[e]										
Wheat flour	3,278,500.0[f]	917,980.0	273,948.8	76,705.7			91.6	840,869.7	1,561,190.0[g]	131,140.0
corn	NC[h]		37,217.4	16,340.3						7,070.2
Oats	0.0		7,302.2	4,965.5	100.0	4,965.5				6,005.1
Rye	0.0		1,648.9	643.1	100.0	643.1				1,402.1
Rice	0.0		21,906.5	5,914.8	100.0	5,914.8				NA
Barley	0.0		2,866.6	1,385.0	100.0	1,385.0				1,436.3
Popcorn	8,990.0	9,619.3	5,856.8[aa]	6,266.7			30.3	2,723.3	4,200.0	2,736.8
Poultry[j]										
Chicken	8,566.1[j]	5,018.9	117,776.8	69,488.3	92.8	64,469.4			5,250.5[i,j]	74,923.4[i,j]
Turkey	2,428.8[j]	2,404.5	24,733.1	24,485.8	90.2	22,081.3			8,741.0[j]	89,193.9[j]
Eggs	55,747.0[j]	35,678.1	81,501.5	52,161.0	31.6	16,482.9			76,214.4[j]	111,424.5[j]
Fish										
Finfish	2,019.8	3,234.1								
Shellfish	0.0									
Total fish	2,019.8	3,234.1	29,915.3	52,052.6	93.8	48,818.5				

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KANSAS FOOD IMPORTS (continued)

COMMODITY	PRODUCTION		CONSUMPTION							
	Production Retail Weight[a] (1,000 lbs)	Retail Value[b] ($1,000 lbs) (1980 dollars)	Consumption in Kansas[e] (1,000 lbs)	Retail Value[b] ($1,000) (1980 dollars)	% Value	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	Acres Cropland Used in KS Production	Acres required to produce 100% of Kansas Consumption[bb]
Wild Game[k]										
Deer	1,442.2[k]	1,730.9	NC							
Pheasant	1,944.0[ee]	2,507.8	NC							
Quail	296.5[ee]	382.5	NC							
Duck	400.0[ee]	516.0	NC							
Dairy Products										
Fluid Milk and Cream	546,530.3	153,028.5	537,062.2	150,377.4			1.7	2,651.1	150,648.3[l]	148,130.1[l]
Cheese & Cottage Cheese	52,400.0	99,036.0	52,057.3	98,388.3			0.6	594.2	90,147.3[l,m]	89,606.4[l,m]
Butter	16,351.0	26,652.1	10,364.4	16,894.0			36.6	9,758.1	81,509.1[l,m]	51,676.8[l,m]
Condensed & Evaporated milk	NC		16,724.3	9,700.1						
Dry Whole & Nonfat Milk	NC		15,782.1	26,829.6						
Ice cream & Ice Milk	53,948.0	41,005.5	60,537.3	46,008.3	10.9	5,007.8			35,672.8[l,m]	39,561.1[l,m]
Vegetables - fresh										
Artichokes	0.0[o]	0.0	706.7	452.2	100.0	452.2			0.0	NA[n,o]
Asparagus	insignificant[o]		706.7	1,229.7	99.9	1,229.7			0.0	176.7
Beans, snap	1,000.0[o]	840.0	3,062.2	2,572.2	67.3	1,732.2			100.0[o]	612.4
Broccoli	0.0	0.0	4,004.4	2,883.2	100.0	2,883.2			0.0	364.0
Cabbage	7,350.0[o]	2,131.5	19,786.5	5,738.1	62.8	3,605.6			350.0[o]	942.2
Carrots	0.0	0.0	14,368.8	5,029.1	100.0	5,029.1			0.0	410.5
Cauliflower	0.0	0.0	3,062.2	2,357.9	100.0	2,357.9			0.0	204.1
Celery	0.0	0.0	17,195.4	8,425.7	100.0	8,425.7			0.0	NA[n]
Cucumbers	408.0[o]	322.3	9,422.5	7,443.5	95.7	7,121.1			85.0[o]	1,963.0
Eggplant	850.0	646.0	1,177.8	895.1	27.8	249.1			85.0[o]	117.8
Garlic	0.0	0.0	1,648.9	6,678.0	100.0	6,678.0			0.0	103.0

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KANSAS FOOD IMPORTS (continued)

COMMODITY	PRODUCTION Production Retail Weight[a] (1,000 lbs)	Retail Value[b] ($1,000) (198 dollars)	CONSUMPTION Consumption in Kansas[e] (1,000 lbs)	Retail Value[b] ($1,000) (198 dollars)	% Value	Retail Value of import ($1,000)	% Export	Retail Value of Export ($1,000)	Acres Cropland Used in KS Production	Acres required to produce 100% of Kansas Consumption[bb]
Green Peppers	1,700.0[o]	1,666.0	7,773.3	7,617.8	78.1	5,951.8			85.0	388.7
Lettuce	0.0	0.0	58,652.8	34,605.1	100.0	34,605.1			0.0	1,675.8
Onions	1,500.0	735.0	24,026.5	24,026.5	93.7	11,038.0			50.0	800.9
Potatoes	31,350.0	7,524.0	116,127.9	27,870.7	73.0	20,346.7			1,650.0[y]	6,112.0
Spinach	1,250.0	1,487.5	1,648.9	1,962.2	24.2	474.7			250.0	333.0
Sweet Corn	9,751.5	3,900.6	15,546.5	6,218.6	37.2	2,318.0			3,000.0	4,782.8
Sweet Potatoes	15,400.0	6,006.0	8,008.8	3,123.4			47.0	2,882.6	800.0	416.0
Tomatoes	2,200.0	1,298.0	26,853.1	24,704.9	94.7	23,406.9			110.0	1,342.6
Turnips	17,500.0	5,075.0	NC		some				700.0	NC
Vegetables- canned & frozen										
Asparagus	NC		848.0	1,199.9						69.7[o]
Beans, snap	NC		16,959.8	6,515.4						2,227.9
Beans, Lima	NC		1,813.8	1,506.6						NA[n]
Beets	NC		2,826.6	1,074.1						109.6
Broccoli	NC		3,297.7	2,902.0						250.0
Brussell sprouts	NC		588.9	954.0						NA
Carrots	NC		3,368.4	1,659.2						62.7
Cauliflower	NC		1,083.5	1,560.2						60.2
Onions	NC		1,601.8	881.0						45.3
Peas	NC		4,569.7	3,228.5						922.4
Pickles (cucumber)	NC		16,253.2	16,903.3						2,519.0
Potatoes	NC		56,532.9	43,344.3						1,370.2
Pumpkin/Squash	NC		942.2	452.3						14.5
Sauerkraut	NC		2,826.6	1,215.4						72.4
Spinach	NC		2,944.4	1,720.0						614.7
Sweet Corn	NC		18,208.3	10,057.0						8,930.6

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KANSAS FOOD IMPORTS (continued)

COMMODITY	PRODUCTION Production Retail Weight[a] (1,000 lbs)	Retail Value[b] ($1,000) (1980 dollars)	CONSUMPTION Consumption in Kansas[c] (1,000 lbs)	Retail Value[b] ($1,000) (1980 dollars)	% Value	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	Acres Cropland Used in KS Production	Acres required to produce 100% of Kansas Consumption[bb]
Sweet Potatoes	NC		2,355.5	1,766.6						158.1
Tomatoes										
Whole	NC		14,368.8	7,759.2						154.2
Catsup, Paste	NC		28,502.0	24,796.7						305.9
Puree	NC		1,884.4	527.6						20.2
Tomato and Vegetable Juices	NC		7,537.7	2,864.3						80.9
Fruits, fresh										
Apples	23,100.0[ff]	9,009.0	37,688.6	14,698.5	38.7	5,689.4			1,800.0[ff]	2,936.8[ff]
Apricots	0.0	0.0	235.6	327.5	100.0	327.5			0.0	18.8[q,ff]
Avocados	0.0	0.0	1,884.4	1,940.9	100.0	1,940.0				NA
Bananas	0.0	0.0	48,995.1	17,638.2	100.0	17,638.2				NA
Cantaloup	10,800.0[ff]	4,212.0	15,546.5	6,063.1	30.5	1,849.3			450.0[ff]	1,036.4[ff]
Cherries	120.0[ff]	130.8[r]	1,413.3	1,540.5	91.5	1,409.6			20.0[r,ff]	188.4[r,ff]
Citrus fruits	0.0	0.0	65,483.9	23,143.2	100.0	23,143.2				NA
Grapes	insignificant	0.0	8,479.9	8,395.1	99.9	8,386.7			0.0	997.6[ff]
Nectarines	insignificant	0.0	3,768.9	4,485.0	99.9	4,480.0			0.0	301.5[ff]
Peaches	8,640.0[ff]	10,281.6	12,719.9	15,136.7	32.0	4,843.7			300.0[ff]	441.7[ff]
Pears	insignificant	0.0	5,653.3	2,939.7	99.9	2,936.7			0.0	452.3[ff]
Pineapples	0.0	0.0	3,297.7	1,220.1	100.0	1,220.1				NA
Plums	insignificant	0.0	3,523.3	2,084.6	99.9	2,082.5				282.7[ff]
Strawberries	1,080.0[ff]	961.2	3,297.7	2,935.0	67.2	1,972.3			240.0[ff]	732.8[ff]
Watermelon	16,200.0[ff]	2,430.0	24,262.0	3,639.3	33.2	1,208.2			450.0[ff]	673.9[ff]
Fruits, processed										
Canned fruit	NC		40,986.3	22,952.3						NC
Fruit juice, chilled & canned	NC		54,483.5	19,069.2						NC

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KANSAS FOOD IMPORTS (continued)

	PRODUCTION		CONSUMPTION							
COMMODITY	Production Retail Weight[a] (1,000 lbs)	Retail Value[b] ($1,000) (198 dollars)	Consumption in Kansas[e] (1,000 lbs)	Retail Value[b] ($1,000) (198 dollars)	% Value	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	Acres Cropland Used in KS Production	Acres required to produce 100% of Kansas Consumption
Dried fruit	NC		6,925.3	12,742.5						NC
Frozen fruit	NC		29,844.6	35,813.5						NC
Legumes, Nuts and Oils										
Soybeans: grits & flour	NC[s]		4,711.1	2,025.8					NC	4,758.7
Beans, dry	33,600.0	12,096.0	15,311.0	5,512.0			54.4	6,584.0	24,000.0	11,778.0
Field peas, dry	0.0	0.0	942.2	329.8	100.0	329.8			0.0	588.9
Coconuts	0.0	0.0	942.2	2,054.0	100.0	2,054.0				NA
Peanuts	0.0	0.0	14,368.8	24,570.6	100.0	24,570.6				7,184.4
Pecans	2,300.0[t]	10,325.0	848.0	3,502.2			66.0	6,822.7	3,500.0	2,442.8
Sunflower seed	45,000.0[u]	NC							30,000.0	NC
Other nuts	insignificant	0.0	3,156.4	8,806.4	99.9	8,797.5				
Soybean oil	244,035.0	244,035.0	53,470.0	53,470.0			78.1	190,564.3	1,450,000.0	317,550.0
Lard	19,224.7[v]	13,265.0	5,888.8	4,063.3			69.4	9,201.8		0.0
Margarine	NC		26,382.0	21,897.1						
Shortening	NC		43,106.3	26,294.8						
Sweeteners										
Refined sugar	49,079.8[x]	12,269.9	196,922.8	49,230.7	75.1	36,960.8			15,000.0	59,441.5
Corn Syrup	NC	NC	9,422.8	7,160.8					NC	NC
Honey	2,150.0	2,558.5	2,826.6	3,363.6	23.9	805.1			0.0	0.0
Molasses	0.0	0.0	471.1	659.5	100.0	659.5			0.0	0.0
Other sweetners	NC	NC	20,964.2	16,561.7						NC
Beverages										
Coffee	0.0		18,373.7	36,562.7	100.0	36,562.7			0.0	NA
Tea	0.0		1,884.9	8,347.9	100.0	8,347.9			0.0	NA
Cocoa	0.0		6,124.4	21,619.1	100.0	21,619.1			0.0	NA
TOTALS	6,434,135.8	5,667,777.0	2,962,577.7	2,180,376.9		539,291.50		4,377,934.6	8,127,325.8	2,117,380.4

FOOTNOTES

a. Retail weight for Kansas production are taken from the 64th Annual Farm Facts, Kansas State Board of Agriculture, 1981 and converted where necessary using USDA Conversion figures.

b. Sources for prices: Food-for-Less, Lawrence, KS; Dillon's, Lawrence, KS (2/51/82); and U.S. Department of Labor Statistics.

c. Consumption in Kansas is based on United States per capita figures in Food Consumption, Prices, and Expenditures, 1960-1980, Statistical Bulletin 672, USDA, 1981.

d. This is the number of cropland acres needed to grow the crops to feed the livestock. It does not include rangeland or pasture.

e. The Kansas food exports and imports chart lists only grain that Kansans eat directly as grain, cereal, flour, or bread.

f. Only flour production, bulghur, wheat germ, and other cereal products are milled in Kansas, but statistics are not available.

g. Only acreage required for flour production.

h. Two large corn mills make Kansas an exporter of corn food products, consumption of corn figures not added to totals.

i. Acreages for broiler production only; old hens which become soup, etc. are counted under egg production.

j. 1981 production statistics and feed rations from Al Adams, Department of Animal Science and Industry, Kansas State University.

k. Production statistics in numbers of head from Mike Cox and Marvin Craft, Kansas Fish and Game, Pratt, KS (1980 statistics).

l. Feed rations determined with the help of Dick Dunham and Ed Call, Dairy Science Extension Specialists, Kansas State University and from KSU Dairy Extension News 1980 Annual Summary, Nov.-Dec. 1980, Vol. (1) 6.

m. USDA, Dairy, Dairy Products Annual Summary, 1980, Crop Reporting Board, Economic and Statistical Service, June 1981. This gives a conversion factor from dairy products to raw milk (needed for calculations).

n. Production of these crops not suitable to Kansas due to climate or soils.

o. Production figures and yields per acre for all vegetable crops from James Greig, Horticulture Department, Kansas State University.

p. Kansas is one of the leading turnip-producing states.

q. Apricot production in Kansas is unreliable.

r. These are tart cherries, no sweet cherries are grown in Kansas, production is unreliable.

s. There are two commercial plants that make soy flour.

t. Mostly native pecan groves, Frank Morrison, Horticulture Department, Kansas State University.

u. Jim Shroyer, Agronomy Department, Kansas State University.

v. Livestock and Meat Statistics, Supplement for 1978, USDA gives the figure of .054 times liveweight equals lard production.

w. Acres are credited under pork production.

x. Kansas produced 400,000 lbs. of sugar beets; 8.15 lbs. of beets equals 1 pound of refined sugar, USDA Agricultural Statistics, 1980, p. 77.

y. A portion of this production and acreage is sent to potato processing plants.

z. Determined with the help of Jack Riley, Animal Science and Industry Department, Kansas State University.

aa. Popcorn Institute 111 E. Wacker Drive, Chicago, Illinois.

bb. Determined by dividing production by lbs./bushel, then bushels per acre (average yield for 1980), and conversion of fresh to processed using conversion factors.

cc. Mike Cox, Kansas Fish and Game, Pratt, Kansas.

dd. Mike Burns, Marketing Division, Kansas State Board of Agriculture, Topeka, KS.

ee. Number of pheasant, quail, and duck harvest in 1980 converted to dressed, retail weight by using figures from The Complete Kitchen Guide by Lillian Langseth-Christensen and Carol Smith (Grosset and Dunlap, New York).

ff. Fruit production and yields per acre from Frank Morrison, Horticulture Department, Kansas State University.

APPENDIX 2

GRAINS AND MISCELLANEOUS FOOD CROPS, PRODUCTION AND USE

COMMODITY	Acres[a] Harvested	Farm Value[a] ($1,000)	Yield/Acre[a] (bushels) *	% acres potentially for direct human[b] consumption in KS	% fed to livestock	% of total utilized in KS	% Export to foreign countries	Total Production (bushels)[*]
Wheat	12,000,000	1,617,000	35.0	1.0	25.0[c]	5.9[d]	66.7[c]	420,000,000
All Corn	1,713,000	480,269						
Corn, grain	1,240,000	396,304	94.0	0.6	80.5[f]	75.1[g]	3.1[h]	116,560,000
Corn, silage	426,000	83,965	9.0	0.0	100.0	100.0	0.0	3,834,000
Oats	120,000	8,664	38.0[e]	3.4	99.0	99.0	0.0	4,560,000
Barley	59,000	5,685	41.0	2.4	100.0	100.0	0.0	2,419,000
Rye	10,000	504	21.0	1.4	100.0	100.0	0.0	210,000
All sorghums	4,400,000	554,595		0.0	100.0			
Sorghum, grain	3,640,000	460,169	43.0	0.0	97.0[j]	59.3[i]	17.6[i]	156,520,000
Sorghum, silage	305,000	52,430	9.0 tons	0.0	100.0	100.0	0.0	2,745,000 tons
Sorgum, forage	455,000	41,996	26.0 tons	0.0	100.0	100.0	0.0	1,183,000 tons
Soybeans	1,450,000	181,830	16.5	22.2[k]	82.0[l]	85.0[m]	8.6[n]	23,925,000
Sugar Beets	15,000	6,280	13.5 tons					202,000 tons
Popcorn	4,200	859	2,140.0 lbs.	65.2%	0.0	65.2%	some	8,990,000 lbs.
All hay	2,200,000	255,915	1.92 tons	0.0	100.0	100.0	0.0	4,230,000 tons
Alfalfa hay	1,000,000	174,758	285.0 tons	0.0	100.0	100.0	0.0	2,850,000 tons
All other hay	1,200,000	81,157	1.15 tons	0.0	100.0	100.0	0.0	1,380,000 tons
Dry beans	24,000	12,096	1,300.0 lbs.	54.4	0.0	54.4	some	33,600,000 lbs.
Totals	302,261,200	4,414,476		15,733,011				

[*] except as noted

Footnotes

a. 64th Annual Report and Farm Facts, Kansas State Board of Agriculture.

b. Number of acres required for production of 1980 Kansas consumption divided by 1980 total acres harvested.

c. Communication with John Dukelow, Agricultural Markets Specialist, Kansas Wheat Commission.

d. Calculated: 25% of wheat when milled (the bran and germ) becomes cattle feed; 82,381,000 bu. of wheat ground in Kansas, plus Kansans flour consumption.

e. Small amount of our oat crop is shipped to St. Joseph, Missouri and elsewhere to make oatmeal, etc.

f. Using feeding rations from Kansas State University, cattle, hogs, sheep, poultry, dairy, cows, and turkeys consume 69,469.8 bu. of corn = 59.6%; plus livestock and poultry feed account for 84% of domestic use (U.S. Corn Industry,by Leath, Myer and Hill, USDA Economic Report #479) or 84% of the 24.9% that is shipped out of Kansas = 20.9%; Grand total is 80.5%

g. Corn Movements in the United States, Leath, Hill and Fuller, North Central Regional Research Bulletin #275, Agricultural Experimental Station, University of Illinois, 1977.

h. In 1977 Kansas had 0.3% of the United States total of corn moving to export regions. (Corn Movements in the United States)= 5,052,000 bushels = 3.1% for 1977.

i. Calculated from Sorghum Movements in the United States, Leath, Hill and Fuller, North Regional Research Bulletin #272, Agricultural Experimental Station, University of Illinois, 1977.

j. There is a sorghum mill in Kansas which uses the flour for industrial purposes to make wallpaper paste.

k. Kansans consume 22.7 lbs./person soybean oil and 20 lbs. soy flour/person per year (Food Consumption, Prices Expenditures, USDA, 1981). Oil outturn for soybeans is 17.9% (Conversion Factors and Weights and Measures, USDA Statistical Bulletin #616, p.36)

l. Almost all soybeans are crushed for oil, extraction is 17.9% (Conversion Factors and Weightsand Measures, USDA Economic Statitical Bulletin #616, p. 36.) The remaining meal becomes livestock feed.

m. Estimate based on use of four large soybean mills in Kansas producing 435,554,000 lbs. of oil in 1980 (64th Annual Farm Facts and Soybean Movements in the U.S. by Leath, Hill and Fuller, North Central Regional Research Publication #273, Agricultural Experimental Station, University of Illinois, January, 1981.

n. Determined from Soybean Movements in the U.S. for Kansas and Nebraska provided .8% of U.S. total. Kansas production was 40.9% of the two state total = 2,067,349 bu. = 8.6% Kansas production.

APPENDIX 3

Kansas Food System Organizations

There are many organizations which directly or indirectly are working toward developing a sustainable food system in Kansas. The following is a selective list of organizations working with consumers, farmers, and the food industry in Kansas.

American Agriculture Movement
Leonard E. Cox, State Coordinator
Weskan, KS 67762

Appropriate Technology Center
Ken Lassman
1101½ Massachusetts St.
Lawrence, KS 66044
(913) 841-3086

Association of Milk Producers, Inc.
Jim Moore, Kansas Division Manager
1601 S. Sheridan
Wichita, KS 67213
(316) 942-2251

Committee of Kansas Farm Organizations
John O. Miller, Legislative Agent
5230 W. 24th St.
Topeka, KS 66614
(913) 272-1745

Conservation Commission
Kenneth Kern, Executive Secretary
535 Kansas Ave., 10th Floor
Topeka, KS 66603
(913) 296-3600

Extension Agents Association
Lila M. Abercrombie, President
Salina County Extension Office
300 West Ash
Salina, KS 67401
(913) 827-3651

Farmers' Newsline
(toll free information number)
(800)-424-7964

From Swords To Plowshares
LaVonne Platt
Box 347
Newton, KS 67114

Grassland Heritage Foundation
Sally Delwiche
5450 Buena Vista
Shawnee Mission, KS 66205

House Agriculture & Livestock Committee
William M. Beezley, Chairman
Kansas Legislature
State Capitol, Room 446-N
Topeka, KS 66612

Kansans for Safe Pest Control
Terry Shafer
R.R. #3
Lawrence, KS 66044
(913) 843-1348

Kansas Area Watershed Council
Dan Bentley
1101½ Massachusetts St.
Lawrence, KS 66044
(913) 842-4418

Kansas Association of Agricultural Agents
Joseph Smith, President
Montgomery County Extension Office
115 S. Sixth
Independence, KS 67301
(316)331-2690

Kansas Association of Corn Growers
Earl Foote, President
RFD #1
Bucyrus, KS 66013

Kansas Association of 4-H Agents
David E. Kehler, President
Cherokee County Extension Office
.O. Box 148
Columbus, KS 66725
(316) 429-3849

Kansas Association of Future Farmers of America
Holton Hall
Kansas State University
Manhattan, KS 66506
(913) 532-5535

Kansas Association of Conservation Districts
Clinton E. Lundquist
Rt. 2, Box 65
Lindborg, KS 67456
(913) 227-3122

Kansas Cooperative Council
Hal Hellbust, Secretary
700 Kansas Ave.
Topeka, KS 66603
(913) 233-4085

Kansas Crop Improvement Association
Lowell A. Burchett, Secretary/Treasurer
205 Call Hall
Kansas State University
Manhattan, KS 66506
(913) 532-6118

Kansas Extension Home Economists
Margaret Hund, President
Jackson County Extension Office
Courthouse
Holton, KS 66436
(913) 364-4125

Kansas Farm Bureau
John Junior Armstrong, President
2321 Anderson
Manhattan, KS 66502
(913) 537-2261

Kansas Farmers Union
Ivan Wyatt, President
P.O. Box 1064
McPherson, KS
(316) 274-4227

Kansas Friends of the Earth
Neil Shanker
730 Fremont
Manhattan, KS 66502

Kansas Pork Producers Council
Doyle Talkington,
Executive Vice President
2601 Farm Bureau Road
Manhattan, KS 66502
(913) 776-0442

Kansas Poultry Association
A.W. Adams, Secretary/Treasurer
P.O. Box 663
Manhattan, KS
(913) 539-5441

Kansas Meat Processors Association
Gilbert Kaiser, President
Kaiser's Meat Processing
216 E. Avenue S.
Lyons, KS 67554
(316) 257-3031

Kansas Natural Resource Council
Gary Kannenburg
5130 Mission Road
Shawnee Mission, KS 66205
(913) 362-5933

Kansas Organic Producers
Jim Lukens
Rt. 3
Beloit, KS 67420
(913) 738-3866

Kansas Rural Center
Fred Bentley
P.O. Box 133
Whiting, KS 66552
(913) 873-3431

Kansas Sheep Association
Clifford Spaeth, Secretary
Animal Science Department
Weber Hall
Kansas State University
Manhattan, KS 66506
(913) 532-6131

Kansas Soybean Association
Verlin Peterson, Secretary
Department of Extension Agronomy
207 Waters Hall
Kansas State University
Manhattan, KS 66506
(913) 532-5776

Kansas State Grange
Edward F. Moody, Master
16851 W. 183rd St.
Olathe, KS 66061
(913) 686-3506

Kansas Wheat Improvement Association
Thomas C. Roberts, President
404 Humboldt
Manhattan, KS 66502
(913) 776-6348

Mid-America Dairymen, Inc
Jack Greenwell, Manager
Kansas City Operations
5200 E. 45th St.
Kansas City, Missouri 64130
(816) 921-2692

Milk Producers Marketing Company
Adolph Olson, Manager
Box 505
Lawrence, KS 66044
(913) 843-5511

The Land Institute
Wes and Dana Jackson
Rt.3
Salina, KS 67401
(913) 823-8967

National Agrimarketing Association
8340 Mission Road
Prairie Village, KS 66206

National Farmers Organization of Kansas
Paul Nauer, President
Jennings, KS 67643
(913) 678-2607

National Parks and Conservation Association
Steve Burr
Rt. 2
Salina, KS 67401

New Destiny Federation
Regional Representative
Diane Luber
The Community Mercantile Food-Coop
700 Maine Street
Lawrence, KS 66044
(913) 842-1203

PRAXIS
Carol Mollner
1620 South 37th St
Kansas City, KS 66106
(913) 236-8336

Sierra Club
Mike Martin
R.R. #2, Box 170
Derby, KS 67037

Small Farm Energy Project
Center for Rural Affairs
P.O. Box 736
Hartington, NE 68739
(402) 254-6893

State Board of Agriculture
901 Kansas
Topeka, KS 66612

United Farm Wives of America
Jeanne Mertz, President
Route 3, Box 260
Manhattan, KS 66502
(913) 456-9605

University for Man Community Gardens
1221 Thurston
Manhattan, KS 66502
(913) 532-5866

Vocational Agriculture
Les Olsen, Supervisor
State Department of Education
120 E. 10th St.
Topeka, KS 66612

Western Kansas Coalition for Clean Water
2921 Ash St.
Hays, KS 67601

Wheat Commission
Steve Graham, Administrator
1021 N. Main St.
Hutchinson, KS 67501
(316) 662-0273

Women Involved in Farm Economics
Peggy Arensmen
R.R. #1
Kinsley, KS 67547